

RESTAURANTS, CLUBS AND BARS

Planning, Design and Investment for Food
Service Facilities

FRED LAWSON



RESTAURANTS CLUBS & BARS

Planning, Design and Investment for Food Service Facilities

Second edition

Fred Lawson



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FOR EVERY TITLE THAT WE PUBLISH, BUTTERWORTH-HEINEMANN
WILL PAY FOR BTCV TO PLANT AND CARE FOR A TREE.

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Introduction

Investment in restaurants is taking place on a massive worldwide scale as social and living habits change, creating an increasing demand for meals taken away from the home. Restaurant design is also constantly evolving to reflect new consumer preferences and operational trends. This applies equally to the many leisure related facilities such as clubs and bars.

At the same time, increasing costs and competition call for more detailed product appraisal and specific marketing, together with a greater understanding of the psychological motivations which channel consumer response. As a result of changing fashions and competition, the life cycle of design is becoming shorter, creating a frequent need for refurbishing and reinvestment.

This new book on restaurants, clubs and bars endeavours to cover all aspects of planning, design and investment. It is based on eight years of international research following the success of the early volumes on restaurant and catering design first published in 1973.

While interpreting design criteria and functional requirements for various types of restaurants, this book is not only concerned with design: it brings together facts and figures about food service operations and examines the markets for various kinds of restaurants; it considers the feasibility of investments and ways in which companies may plan and organise development strategies.

In addition to covering all kinds of commercial restaurants, from fast-food outlets to nightclubs, this comprehensive reference book also examines requirements for food services in the social and welfare sectors. A section is devoted to food preparation equipment and the design of kitchens for different types of operations. Emphasis is given to new innovative ideas and trends in food service, looking ahead to design requirements for the next five years and beyond.

In order to provide a factual text it has been necessary to abbreviate discussion and to quote typical or representative situations and figures. These can vary with individual cases and this book should not be seen as a substitute for professional advice.

To illustrate the work of experts in this field, a large number of examples have been selected which show some of the most interesting projects worldwide.

While every effort has been made to ensure a fair and accurate representation of information, no responsibility can be accepted for any omissions or errors.

I am most grateful for all the general cooperation and help I received in assembling this material and regret that space and time prevented many other important examples being included. The names of the designers, architects or owners are quoted for further information.

Most of all, I am indebted to my wife for her long forbearance.

Preface to second (paperback) edition

The original version of this book, published in 1987, foresaw most of the trends which are now becoming evident in restaurant and food service operations. Similarly, the examples carefully selected to illustrate concepts and features are still relevant for design reference. Hence, the changes in this edition have concentrated on updating the statistics and background information summarised in Chapter 1.

Although many sources have been consulted it was found that the variation in statistical bases and ranges of coverage made direct comparisons for surveys difficult. To avoid confusion this first chapter draws on the marketing and consumer research provided by acknowledged leaders in these fields namely, Euromonitor, Marketpower, HCITC and the Brewers Society/MORI studies. For American statistics, reference has been made to the surveys reported in *Restaurants & Institutions* (Cahners) and *Restaurants USA* (National Restaurant Association). I am most grateful for this generous co-operation.

Costs of development have changed little in constant 1987 prices after a period of growth followed by recession. For current 1994 prices, the costs indicated in pages 40, 42 and 44 can be multiplied by a factor of 1.25 in line with building cost indices.

It is hoped this paperback version will be of value to a wide range of users.

Symbols used on plans

Storage areas

- 1  Shelving
 2  Vegetable racks
 3  Vegetable bins
 4  Storage bins
 5  Weighing machine
 6  Mobile racks
 7  Trolleys

Preparation areas

- 8  Work table or bench
 9  Work bench with cupboard/drawers
 10  Work bench with waste bin
 11  Worktop with shelves over
 12  Single sink with drainer
 13  Double sink unit
 14  Mobile sink
 15  Wash-hand basin (with dryer)
 16  Marble-topped bench
 17  Vegetable rack
 18  Salad preparation unit
 19  Pot rack
 20  Trolley
 21  Mobile trays
 22  Refrigerator
 23  Mobile refrigerator/refrigerated trolley
 24  Deep freezer
 25  Potato peeler
 26  Chipping machine
 27  Mixing machine
 28  Slicing machine/vegetable mill
 29  Chopping block
 30  Cutting board

Cooking area

- 31  Proving oven
 32  General purpose oven
 33  Pastry oven or pizza oven
 34  Forced-air convection oven
 35  Steaming oven/pressure steamer
 36  Microwave oven
 37  Broiler
 38  Boiling top with open top burners
 39  Boiling top with solid top
 40  Bratt pan
 41  Oven range with boiling top
 42  Griller or salamander
 43  Deep fat fryer
 44  Boiling pan - rectangular type
 45  Boiling pan - circular
 46  Open well bain-marie
 47  Extraction hood over equipment
 48  Griddle plate
 49  Toaster

Serving area

- 50  Plate lowerator or dispenser
 51  Hot cupboard unit
 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
 60  Beverage unit
 61  Coffee unit
 62  Counter unit - unheated

- 63  Counter unit - with infra-red 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
 74  Dishwashing machine - 'flight' type
 75  Clearing trolley
 76  Waste-disposal unit or scraping point
 77  Water boiler
 78  Water softening equipment
 79  Refuse bins (under counter)

Bar area

- 80  Wine refrigerator
 81  Ice-making machine
 82  Bottle storage racking
 83  Glass storage racking
 84  Beer engine or dispense points
 85  Glass-washing machine
 89  Ice well and inset containers

Dining areas

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

1

Food Service Operations

1. Definitions

1.01 Food services

Food service may be simply defined as the provision of food and beverages ready for consumption away from home. In contrast to grocery shops and stores which sell food, the operation of food services usually involves:

- preparation and cooking, or heating and assembly of food on the premises,
- individual control over the standards of the products supplied,
- personal service and consumption of food on the premises.

These characteristics are not precise since food services vary widely in the way they operate. At one extreme, vended products and fast food units are highly standardised and high volume sales are mainly across the counter for off the premises consumption. At another level, food services may be concerned with large scale central production of meals for remote service in work places or in transport catering.

The distinctions between food services and retailing are also becoming blurred by changes in food processing and packaging and the overlap of interests has led to an increasing investment by retail, hotel and leisure groups in setting up their own food service operations either independently or through agreements with established restaurant chains.

1.02 Definitions of restaurants

The broadest definition of a restaurant is 'an establishment where meals or refreshments may be obtained'. This encompasses a wide variety of premises from commercial establishments operated for profit to social and welfare services. Definitions are complicated by the highly competitive and mercurial nature of restaurant business.

The life cycle of an investment is often short (averaging seven years for most commercial restaurants) and new food concepts and descriptions are constantly being devised. However, the image presented by an establishment is a key factor in promoting market awareness and attracting custom. To a large extent this is reflected in the name which must accurately portray the style of operation, price, menu specialism and other characteristics.

Some generic descriptions like restaurant, coffee shop, café, bistro and inn are well established although often modified from their traditional character. Others, particularly in the fast food area, may be identified by the food specialisation (burger, pizza, steak, chicken, fish etc.) or by association with a 'family' name, home cooking, country life or ethnic characteristics. Restaurant characteristics are described in

sections 5.01–5.11 and in Chapter 10.

1.03 Classifications

Food services can be broadly grouped into two main sections, commercial or consumer catering and institutional food services.

Commercial food services are businesses operated by commercial organisations covering all kinds of eating places, take-away food shops, public houses, bars, clubs and hotels providing meals. They also include catering contractors operating food services on behalf of clients or as commercial concessions.

Institutional food services include industrial, educational, government or institutional organisations which operate their own catering as a service to their main business. These encompass feeding services for employees, schools, hospitals, institutions providing social and welfare services and transportation requirements such as in-flight catering.

In Great Britain, the Standard Industrial Classification (SIC) 1980 identifies seven main commercial activities but does not take account of institutional feeding services. Food services in the United States are categorised by the Department of Commerce into four categories (SIC Code 5812) covering local restaurants, travel food services, contract institutional food services and vending services.

Other criteria have been used in consumer and industry surveys to distinguish different types of restaurants, for example:

Classification	Examples of descriptions
Type of service	Table service, counter or bar service, cafeteria service
Market orientation	Popular, medium or high quality restaurants; quick service, mid-scale or up-scale markets
Average spend	Low, medium or high average spending power
Type of establishment	Hotel restaurant, pub-restaurant, store restaurant, wine bar, night club, fast-food unit
Menu range	Haute cuisine, full menu, limited menu
Food specialisation	Pizza, hamburger, chicken, fish, steak, ethnic foods
Style of operation	Bistro, café, coffee shop, brasserie
Ownership	Chain, individual or franchised restaurants

The design characteristics of different types of restaurants are summarised in Chapters 1–5 and examined in more detail in Chapter 10.

Sheraton Amsterdam Airport Hotel and Conference Centre

The food service facilities of the Sheraton Amsterdam Airport Hotel, which is due to open in Spring 1996, are designed to provide a main restaurant, speciality restaurant, lounge bar, bistro and delicatessen bars, in addition to banqueting for 300 plus and room service for the 420 luxury business rooms.

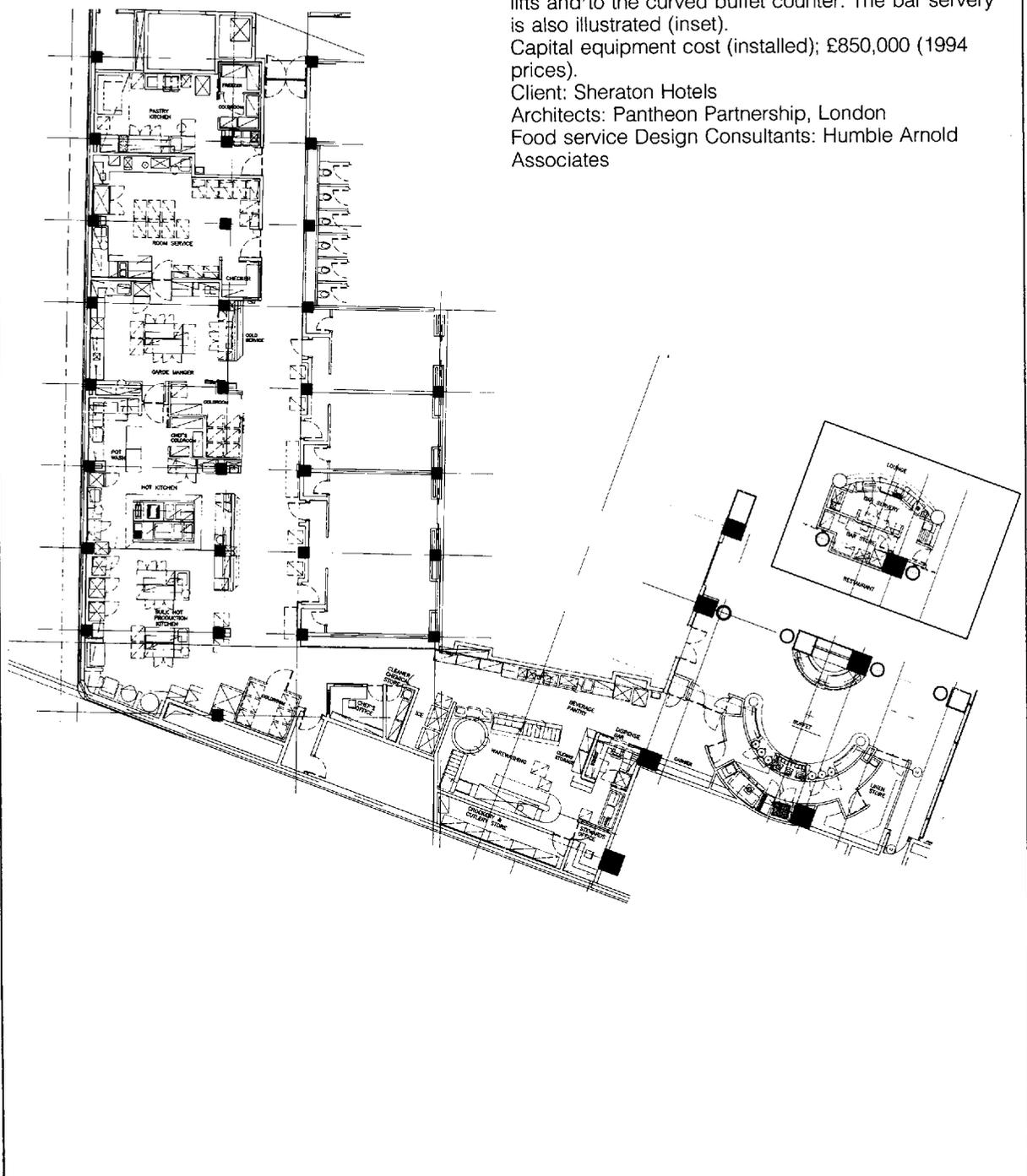
The main production area has separate zones for bulk hot production and hot kitchens, garde manger, pastry kitchen, room service and dish washing. Extensive provision is made for rapid chilling of prepared food in order to maintain high quality. The hot kitchen uses a purpose designed cooking island. There is direct access to the function rooms, to service lifts and to the curved buffet counter. The bar servery is also illustrated (inset).

Capital equipment cost (installed); £850,000 (1994 prices).

Client: Sheraton Hotels

Architects: Pantheon Partnership, London

Food service Design Consultants: Humble Arnold Associates



2. Commercial food services worldwide

2.01 Markets for commercial food services

Commercial food services make up one of the world's largest consumer markets, worth over US\$ 740 billion in 1991. This sum represented just over 5 per cent of estimated world consumer expenditure.

Ten countries accounted for 78 per cent of the global expenditure on commercial food services with the US and Japan together making up 51 per cent of the market. The large differences in per capita consumption revealed by the Euromonitor surveys demonstrated both wide cultural and life style differences and also the potential for growth.¹

<i>Major markets: commercial food services 1991</i>			
<i>Country</i>	<i>\$US million</i>	<i>Country</i>	<i>\$US million</i>
US	205,900	Australia	6,336
Japan	174,114	Netherlands	5,398
Germany	36,000	Mexico	5,510
Italy	34,452	Argentina	4,716
France	33,796	Thailand	4,220
Spain	29,842	Taiwan	4,057
UK	27,740	Belgium	3,344
Canada	19,310	Portugal	2,798
China	9,623	Greece	2,401
Brazil	7,321	Others	122,342
		Total	739,220

Source: Euromonitor Market Direction Report 15.2, 'Consumer catering strategic management overview', Euromonitor, 1993.

<i>Main regional markets</i>	<i>% of global expenditure</i>	<i>Per capita expenditure (\$)</i>
North America	30	813
South East Asia (including Japan)	27	460
Western Europe	24	467

Source: Euromonitor Market Direction Report 15.2, 'Consumer catering, strategic management overview', Euromonitor, 1993.

2.02 Growth and impacts of recession

Over the five years 1986–91 Euromonitor estimated the value of the world consumer catering market grew by 33 per cent or some \$185 billion, with particularly strong growth in Europe (43 per cent), South East Asia and Japan (40 per cent), North and Latin America (30 per cent).²

This period included the 1989–92 recession causing reductions in disposable income and trading down in consumer expenditure. During the recession years real growth contracted in the UK and Italy and overall growth remained relatively static in the US and Germany suggesting market

maturity and saturation. Increasing market shares were gained by quick service restaurants – particularly fast food outlets – and ethnic and theme restaurants at the expense of traditional restaurants. Hotels, generally were the weakest sector.

2.03 Characteristics of commercial food service operations

Although there has been a large expansion in chain operations, through the development of company owned and franchised units, the commercial food service industry is characterised by a high percentage of small independent or



(a) The Atrium Bar



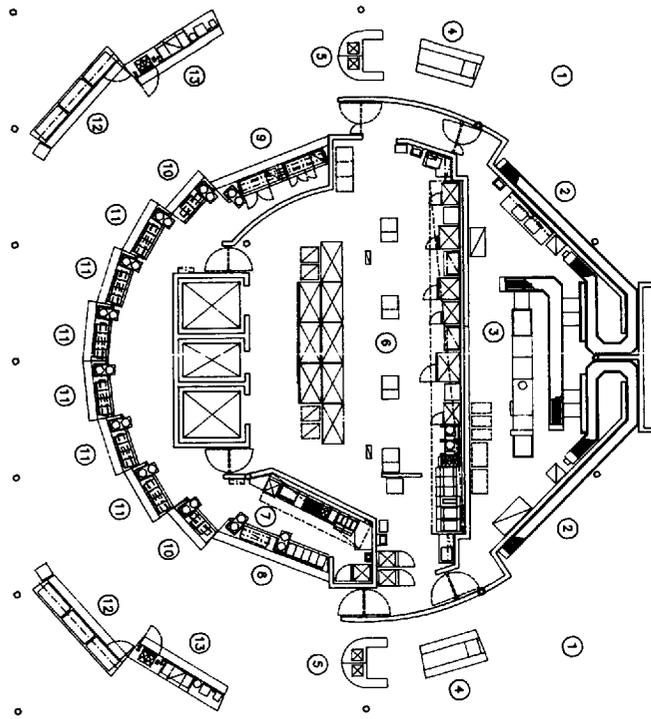
(b) Le Chat Botte

Hotel Beau Rivage, Geneva

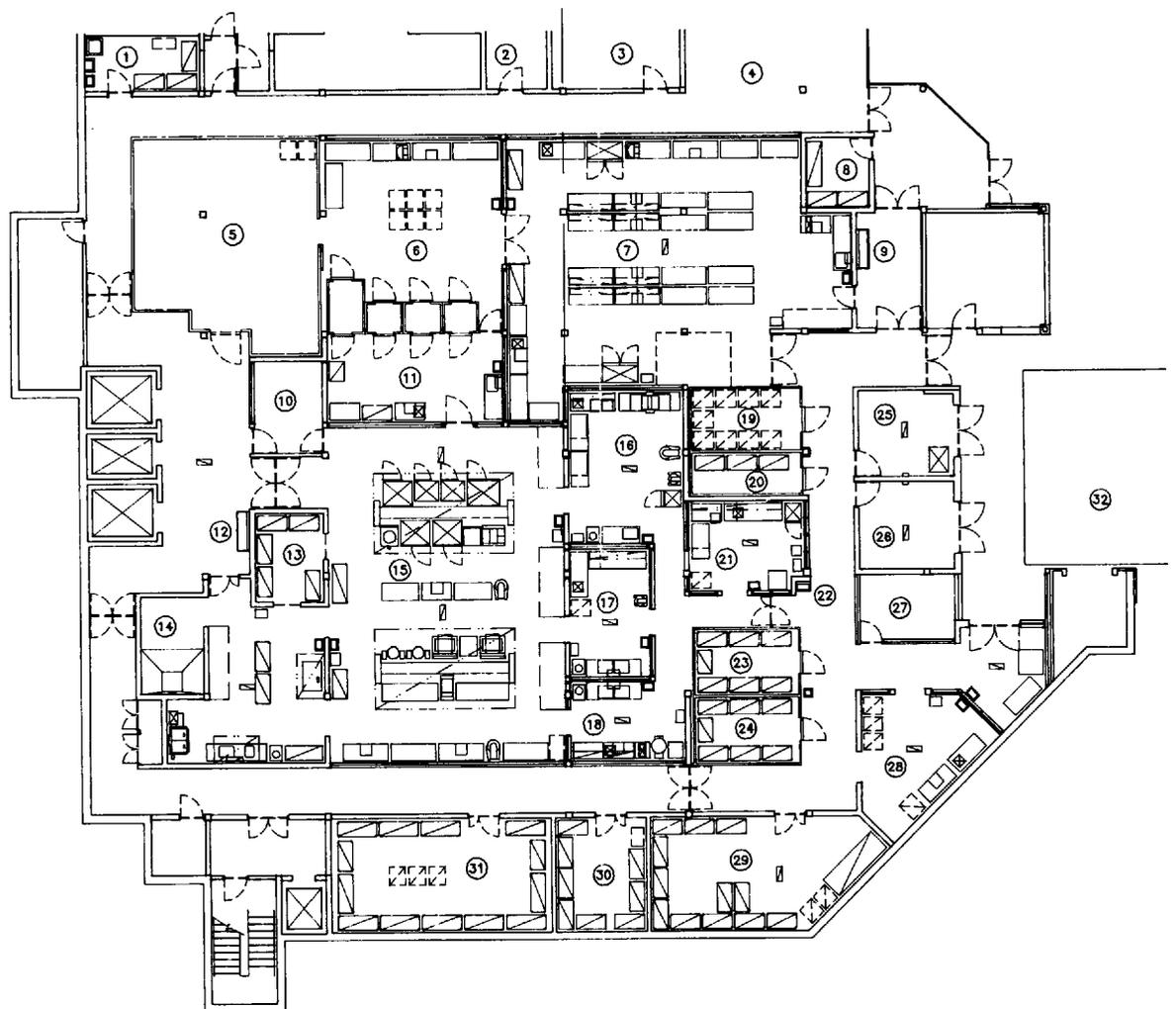
Refurbishment of the elegant interiors of the de Luxe 5-star Hotel Beau Rivage. The hotel, which has one of the finest views over Lake Geneva, was built in 1865 and has been operated by the Mayer family for four generations.

Interior Design: Leila Corbett Ltd

Clients: Hotel Beau Rivage, Geneva



- Key**
- Left**
- 1 Dining area
 - 2 Dirties dump
 - 3 Wash-up
 - 4 Cutlery and condiments station
 - 5 Cashiers stations
 - 6 Preparation and regeneration
 - 7 Grill/cook
 - 8 Grill bar
 - 9 Cold buffet
 - 10 Hot sweets counters
 - 11 Hot counters
 - 12 Cold counters
 - 13 Beverage counters
- Below**
- 1 Cleaners store
 - 2 Male changing
 - 3 Female changing
 - 4 Staff rest room
 - 5 Refrigerated holding room
 - 6 Portioning room
 - 7 Roll production
 - 8 Linen store
 - 9 Hygiene station
 - 10 Production managers office
 - 11 Pre-chill portioning
 - 12 Hygiene station
 - 13 Equipment and utensils store
 - 14 Trolley wash
 - 15 Cooking area
 - 16 Pastry preparation
 - 17 Protein preparation
 - 18 Vegetable preparation
 - 19 Freezer
 - 20 Coldroom
 - 21 Issues area
 - 22 Hygiene station
 - 23 Protein coldroom
 - 24 Vegetable coldroom
 - 25 Refuse store
 - 26 Empties and tray wash
 - 27 Stores controller
 - 28 Decant area
 - 29 Dry goods store
 - 30 Contract store
 - 31 General store
 - 32 Loading bay



British Telecom, Research and Technology, Ipswich
 Located in a new stand alone catering amenities building the kitchen is designed for cook-chill production serving 2500 meals per day. The main production area is located in the basement, with loading bay giving access to storage and refuse zones. Three lifts convey chilled food to a circular service area at ground floor adjacent to the restaurants. This is planned with separate zones for

preparation and regeneration, dishwashing and serveries. The latter includes cold buffet and grill bar counters.

Opened in Spring 1991 with a capital equipment (installed) value of £1,100,000 (1990 prices).
 Clients: British Telecom
 Architects: D.Y. Davies Associates
 Food service Consultants: Humble Arnold Associates

family run businesses. For example in 1991, 68 per cent of restaurants and 70 per cent of hotels in the UK were owned or operated by sole proprietors or partnerships³ and a similar structure was reported in other countries in Europe.

In the United States the majority of eating and drinking places were single-unit operations.⁴

2.04 Major companies

The ten years to 1994 witnessed many changes in company structures. In addition to the development of new food concepts, there were extensive acquisitions of existing companies and master franchises of established product brands.

The fast food chains – in particular – extended their international coverage and in 1990 included the largest companies: McDonalds (12,420 outlets); PepsiCo (21,100 KFC, Pizza Hut and Taco Bell units); Grand Metropolitan (Burger King) and Allied Lyons (Dunkin Donuts, Baskin Robbins).

Many of the large national groups such as Accor (France), Forte (UK) and Hoteles Unidos SA (Spain) operated hotels in addition to restaurant chains and diversified catering services. Companies like SME Sirea/Autogrill (Italy), BAB – Raststätten und Erfrischungsdienste (Germany), LSG Lufthansa Service (Germany) and Compass (UK) had wide interests in transport and contract catering. Allied Lyons (UK), Casino (France) and General Mills (US), primarily involved in food manufacture and/or retailing, also operated restaurants and the large UK brewery companies (Whitbread, Bass, Greenalls) developed their own chains of restaurant brands.

2.05 Institutional food services

This sector covers a wide field of services for education, healthcare, social and welfare institutions and military units. Most institutions operate their own food services in order to meet particular needs (for dietary and social purposes) although the trend is towards competitive contracting arrangements. As a rule, public sector expenditure on food services is regulated by:

- cost limits for capital investment on kitchens and dining rooms (based on numbers of people served),
 - operating budgets with set price limits and subsidies (based on numbers of meals).
- Institutional catering in the UK covered some 59,590 sites in 1992 supplying 1,836 million meals. Catering contractors operated 2,082 sites. In the European Union as a whole the combined institutional/industrial sector encompassed 16.2 per cent of all food service outlets.⁵

2.06 Industrial/employee food service

Food services at places of work, originating from wartime legislation, have extended in response to operational needs (employee welfare, fringe benefits, convenience and productivity) and trades union or social pressures. In the 1980s and 1990s employee food services throughout Europe have been affected by the decline of traditional industries – which involved high concentrations of labour – by relocations and development of new technology.

In the UK, employee catering services were operated in some 23,170 worksites in 1992 of which 7,850 were serviced by catering

Outlets: 1991(b)	France	Germany	Italy	Spain	UK	Others(a)	Total	%
Accommodation	53,190	39,455	42,850	12,000	60,140	17,960	225,595	14.0
Restaurants	87,770	61,450	51,620	40,000	15,890	37,820	294,550	18.4
Fast food	1,135	835	180	5,000	1,150	2,345	10,645	0.7
Cafés/takeaways	3,285	23,640	101,080	50,000	33,990	37,130	249,125	15.5
Pubs/bars	72,120	89,605	11,435	70,000	66,840	94,160	404,160	25.2
Travel	415	2,015	355	200	1,180	455	4,620	0.3
Leisure/clubs	3,790	16,080	24,355	35,000	53,205	22,300	154,730	9.7
<i>Commercial sector</i>	221,705	233,080	231,875	212,200	232,395	212,170	1,343,425	83.8
Employee catering	10,990	20,460	5,405	2,000	23,700	11,720	74,275	4.6
Health care	16,465	16,595	6,695	3,000	21,810	8,535	73,100	4.6
Education	38,850	320	21,975	2,000	349,109	6,025	104,080	6.5
Services/welfare	1,885	570	1,205	250	3,100	870	7,880	0.5
<i>Institutional/industrial</i>	68,190	37,945	35,280	7,250	83,520	27,150	259,335	16.2
TOTAL	289,895	271,025	267,155	219,450	315,915	239,320	1,602,760	100.0

(a) Belgium, Luxembourg, Denmark, Greece, Netherlands, Portugal.

(b) See 4.01 for descriptions of outlets.

Source: Extract from Marketpower European Catering Database, 1993. Figures rounded

contractors.⁵ The majority of the catering services were subsidised by the employers.

Apart from the broader needs of oil rig and remote work areas, employee food services are characterised by highly concentrated demands over the two hour midday meal period. In addition, there is an extensive supplementary requirement for snack and beverage vending machines and mobile catering services.

Country	Food service outlets: population	
	Commercial	Total(a)
France	1:253	1:194
Germany	1:333	1:286
Italy	1:248	1:216
Spain	1:187	1:180
UK	1:245	1:180
Others	1:257	1:228

(a) Including institutional/industrial outlets.

3. Food services in Europe

3.01 Numbers of outlets

The total number of food service outlets in the European Union was estimated by Marketpower at just over 1.6 million in 1991 of which 1.34 million were commercial establishments and 0.26 million in the institutional/industrial sector.⁶

3.02 Density of outlets

In the European Union as a whole the ratio of commercial food service outlets to population was 1:255 and for all food service outlets (including the institutional/industrial sector), 1:214. The highest density of commercial outlets was in Spain, being influenced by tourism markets, whereas the low ratio in Germany reflected the changes arising from unification.

3.03 Commercial food service markets

In Europe restaurants continue to form the largest market segment except in the UK where fast food takeaway chains have expanded strongly in recent years (see section 4.07). Fast food has only a small segment share in Spain (1.1 per cent) and Italy (0.4 per cent).²

4. Food services in the United Kingdom

4.01 Characteristics

The UK food services industry illustrates the diversity of outlets. More than in other countries in Europe, there is a high proportion of fast food/takeaway units represented by traditional fish and chip restaurants and the rapid expansion of chain hamburger, chicken and pizza operations.

Conversion of public houses to serve meals has had a major impact and the increase of ethnic

Comparison of the five major market areas					
Base 1991(a)	France	Germany	Italy	Spain	UK
(US\$ per annum)					
Per capita expenditure on commercial food services(b)	599	425(c)	598	759(d)	483
<i>Market shares: percentage of expenditure</i>					
Restaurants/cafés	60.3	39.9	61.0	33.0	21.8
Hotel restaurants	12.7	7.5	15.6	22.0	18.2
Cafés	22.2	5.7		14.6	
Bars/restaurants/taverns		29.5	6.8	28.1	
Bars/paninoteche			14.0		
Pubs/clubs/discos		3.3			22.0
Leisure					1.3
Retail				0.4	1.2
Travel catering			2.2	0.8	2.6
Fast food outlets/takeaways	4.8	5.4	0.4	1.1	32.9
Ice cream parlours		2.3			
TOTAL	100.0	100.0	100.0	100.0	100.0

(a) Different survey base to numbers of outlets.

(b) See 2.01 for comparative national expenditures.

(c) Following reunification.

(d) Affected by large tourist expenditure.

Source: Euromonitor Market Direction Report 15.2, 'Consumer catering, strategic management overview', Euromonitor, 1993.

restaurants – particularly Indian and Chinese – has displaced many of the traditional establishments.

4.02 Changes in structure

The Catering Industry Population File published by Marketpower⁶ provides data on the size, structure and development of food services. In terms of value of sales, food services is the fifth largest consumer market in the UK after food, cars, insurance and clothing.

Between 1982 and 1992 the numbers of commercial outlets reduced by 2 per cent whilst those in the institutional/industrial sector increased by 3.2 per cent although the latter showed a marked reduction from the peak in 1989.

Numbers of meals supplied annually by commercial premises rose by one third (33.3 per cent) during this period and total meals, including those provided by the institutional/industrial sector, by 14.6 per cent.⁶ Public houses experienced considerable changes with rationalisation and sales of brewery owned properties resulting in a net loss of 19.8 per cent in numbers of premises over the ten years but with over 72 per cent increase in meals supplied.

The seven major fast food chains doubled their outlets with a similar increase in the numbers of meals sold.

Reflecting the effects of recession and loss of industrial capacity, employee catering reduced by 14.8 per cent both in numbers of outlets and meals supplied. Organisational changes in school meals together with the effect of falling birthrates, have also led to reductions in the educational segment.

4.03 Expenditure on meals eaten away from home

Meals eaten away from home accounted for £9.39 per week in 1990 or 3.6 per cent of UK household expenditure. At constant prices, total consumer expenditure dropped by 4.7 per cent between 1989–92.

Total consumer expenditure on food from food service outlets		
Year	£ Billion (a)	
	At current prices	At 1987 prices
1987	12.7	12.7
1990	17.2	13.9
1992	17.6(b)(c)	12.1

(a) Including foreign visitor and institutional expenditures

(b) Expenditure by the foodservice industry on food was estimated at £6.6 billion in 1992

(c) VAT contributions on food alone amounted to £1.4 billion⁷

Source: 'Family Expenditure Survey', Catering Industry Population File, Marketpower, 1993.

	Numbers of outlets			Million meals (a)		
	1982	1989	1992	1982	1989	1992
Accommodation(b)	55,475	59,763	60,209	431	557	525
Restaurants(c)	14,950	15,780	15,725	330	367	354
Fast food(d)	587	981	1,241	236	396	459
Cafés/takeaways(e)	34,100	35,090	33,002	1,610	1,557	1,645
Pubs/bars(f)	77,672	74,153	62,282	659	1,268	1,136
Travel	819	1,125	1,199	208	344	373
Leisure/clubs(g)	48,649	52,488	53,891	600	918	936
Commercial sector	232,252	239,380	227,551	4,073	5,408	5,428
Employee catering(h)	27,186	23,930	23,173	1,750	1,600	1,491
Health care(i)	11,890	20,555	21,649	665	773	770
Education(j)	37,820	35,338	34,721	1,005	952	921
Services/welfare(k)	3,210	3,040	3,148	146	140	145
Institutional/industrial sector	80,106	82,863	82,691	3,566	3,465	3,327
TOTAL	312,358	322,243	310,242	7,639	8,873	8,755

(a) Includes meals served to foreign visitors, residential meals in Health Care sector and Meals on Wheels

(b) Hotels, guesthouses, holiday camps, caravan parks

(c) Including ethnic, themed and instore restaurants

(d) Based on 7 major chains only

(e) Cafés, sandwich bars, takeaways

(f) Public houses, wine bars, working mens clubs

(g) Visitor attractions, leisure centres, sports and social clubs, theatres, events, mobile caterers

(h) Staff catering including contracted services, off-shore catering

(i) Hospitals, clinics, day centres, residential nursing homes

(j) Schools, universities, colleges

(k) Police stations, fire stations, armed forces, prisons, welfare services

Source: Marketpower, 'Catering Industry Population File', 6th edn, 1993

4.04 Choice of eating place

Surveys by MORI in 1992 identified the main preferences of consumers who eat out in the UK. Over half of the consumers eating out at lunchtime chose a public house. For an evening meal the majority (33 per cent) chose a Chinese or Indian restaurant although 29 per cent preferred a pub and 18 per cent chose a steak restaurant, a high proportion of which are also associated with public houses. Women (53 per cent) are just as likely as men (50 per cent) to eat in a pub at lunchtime.⁸

<i>Choice of eating place – 1992</i>		
<i>Base: all who eat out</i>	<i>Lunchtime %</i>	<i>Evening %</i>
Pub	52	29
Chinese/Indian	3	33
Italian/pizza	5	19
Steak restaurant	4	18
Café/snack bar	19	2
Takeaway	6	8
Hamburger restaurant	6	5
Fish and chip restaurant	5	5
Wine bar	5	2
Club	1	2

Note: Includes some dual answers.

Source: Brewers Society Report, *Choice: Consumers views of pub-going*, MORI/Brewers Society, 1992.

4.05 Public houses

A third of the adult public of the UK visit a pub at least once a week and over half go once a month making this one of the country's most popular leisure activities.

<i>Frequency of visits</i>		
<i>Base: all adults – 1992</i>	<i>Once a week %</i>	<i>Once per month %</i>
Pub	33	54
Social club	11	20
Sports club	9	17
Pub restaurant	6	28
Restaurant	6	28
Nightclub/disco	6	14
Wine bar	2	7

Source: Brewers Society Report, *Choice: Consumers news of pub-going*, MORI/Brewers Society, 1992.

The pub is still seen as a place for a night out with 40 per cent of regular customers visiting in the evening compared with 15 per cent at lunchtime. Patronage of public houses is typically made up of 2–2.5 times as many men as women, with a high proportion of customers in the younger

age groups. Some 17 per cent are couples and 14 per cent groups of mixed sex.¹⁸ About 40 per cent of patrons, particularly men, drink at the bar counter. However, each pub has a different pattern of trade depending on its location, catering and time of the year. Patronage tends to be highly localised being influenced by the choice of beers and food and the social atmosphere.

Pub usage tends to be concentrated, peak sales invariably occurring after 9.00 pm and particularly at weekends, Friday–Sunday. Lunchtime trade attracts about one-third peak density but can be 50 per cent or more in convenient locations where pub catering is provided.

4.06 Structure

In England and Wales the sale of alcoholic drink is regulated by a system of licensing (see Chapter 10, section 5). In 1992 the licensed trade was made up of the following.

	<i>Number of premises</i>
Full on-licences (pubs, hotels)	83,310
Restricted on-licences (restaurants)	31,870
Licensed and registered clubs	32,040
Off-licences (shops, supermarkets)	52,020

Source: Brewers Society, *Beer Facts*, 1993.

Consumers expenditure on beer totalled £13,539 million in 1992. At constant prices this represented a 37 per cent reduction on the sales in 1987. About 77 per cent of beer with a value of some £10,425 million, was sold in pubs and clubs in 1992 and 23 per cent through the off-licence sector. Sales through pubs and clubs fell by 25 per cent between 1979 and 1992.⁹

<i>Numbers of Brewers</i>	1992	1987	1982
Operating companies	64	66	78
Operating breweries	95	112	131

Additionally, about 110 small wholesale breweries were operating and about 95 pubs brewed their own beer. The brewers managed 13,500 full on-licences in 1992, investing an annual capital expenditure of £1,102 million, including £708 million spent on retailing developments.⁹

Source: Brewers Society, *Beer Facts*, 1993.

4.07 Pub catering

In 1992 about 63,500 pubs served bar meals and 7,000 had full service restaurants, together providing some 1,136 million meals.¹⁰

<i>Estimated value of pub and club catering market</i>		
<i>£ millions</i>	<i>1991</i>	<i>1987</i>
Pubs	2175	1570
bar food	1015	745
food counter	485	380
branded restaurants	440	245
restaurants	235	200
Clubs	170	150
Food total	2345	1720
Alcohol(a)	705	515
Total	3050	2235

(a) Alcohol sold with meals.
Source: Euromonitor Market Direction, 1993

4.08 Fast food

Fast food/takeaway chains have made a greater impact on food services in the UK than elsewhere in Europe, mostly through the acquisition of master franchises of international brands.

In 1992, McDonalds commanded 25 per cent of the market, Burger King (Grand Metropolitan) 10 per cent, Pizza Hut (PepsiCo/Whitbread) 7 per cent, Wimpy 6 per cent, Kentucky Fried Chicken (PepsiCo/Forte) 3 per cent and Pizzaland (Brightreasons) 3 per cent.¹¹

Other products included traditional fish and chip shops and sandwiches, the latter being widely supplied through retail shops as well as caterers.

4.09 Catering contractors

Contract catering in the UK has expanded with the privatisation of many public services adding to the major markets in employee feeding.

<i>Contract catering sector 1992</i>	<i>Number of contracts</i>	<i>%</i>
Commercial food services	280	3
Employee catering	7850	77
Health	380	4
Education	1220	12
Services/welfare	480	5
TOTAL	10210	100

Source: BHA/Marketpower, 1993¹²

The UK contract catering industry in 1992 was dominated by three large groups, Compass, Gardner Merchant and Sutcliffe Catering.

4.10 Employment in the food services industry

Surveys by the HCITC show that the UK catering industry employed 2.4 million in 1992, some 9.5 per cent of the national workforce. Commercial

sectors accounted for 1.3 million, 55 per cent of the total. Major employers were: pubs and bars (327,000); restaurants (295,500); hotels (289,200); clubs (138,300) and contract caterers (115,700); 165,000 were self employed.¹³

Most establishments were small, the average numbers of employees per establishment being 5.7 in hotels; 2.9 in restaurants; 4.3 in pubs and bars; 8.8 in clubs and 6.7 in contract catering.

In the institutional/industrial sectors there were 1.1 million employees, of which 28 per cent worked in food preparation and cooking, 14 per cent in food and drink service and the remainder in housekeeping and related services.

A high proportion of the employees were female; averaging 60 per cent in the commercial sectors and 86 per cent in institutional/industrial sectors. Part time workers accounted for 63% of all employees in 1992.¹³ The workforce in commercial sectors was also relatively young: nearly 30 per cent were aged between 16 and 24 years (compared with 20 per cent employed in all sectors of the economy). In restaurants this proportion averaged 44 per cent.

Employee turnover and recruitment rates in the commercial sectors was around 30 per cent in 1992 with increasing evidence of skill shortages in 1992-93.¹³ Broadly similar characteristics were reported in France and Western Germany.¹⁴

5. Food services in the United States

The United States of America is the largest national consumer market for commercial food services with sales of \$202 billion in 1992; 27.5 per cent of the world total. This was also the third largest consumer market in the United States after automotive dealers and food stores.¹⁵ Average per capita expenditure on commercial food services was \$808, one of the highest worldwide.

Numbers of commercial food service outlets increased from 467,400 (1988) to 531,200 (1990)¹⁶ with a projected rise to 560,000 units in 1992. Full service restaurants made up 30 per cent of all commercial establishments and fast food outlets 27%.¹⁷

5.01 Analysis of sales

Annual surveys by the *Restaurants and Institutions* magazine put the total expenditure on food services in 1993 at \$270.15 billion, 74.1 per cent in commercial establishments and 25.9 per cent through the institutional/industrial sectors, the latter including commercial catering contractors. Total sales were forecast to rise to \$302.3 billion by 1995.¹⁸

<i>Expenditure on food services: USA 1993</i>	
<i>Segment</i>	<i>\$ Billion</i>
Fast food	86.12
Full service restaurants	84.01
Lodging	9.71
Retail/stores/supermarkets	9.09
Recreation	4.48
Transportation	3.51
Social caterers	3.17
Business/industry	17.91
Schools/colleges	23.27
Hospitals	11.87
Nursing/elder/childcare	8.33
Military	6.16
Other	2.52
	<u>270.15</u>

Source: R.I. Market Forecast 1994, 'The forecast by segment' in *Restaurants and Institutions*, January 1994.

5.02 Analysis of market shares

Fast food sales make up the largest segment and has the fastest growth rate. Full-service restaurants, particularly fine dining, were affected to a greater extent by the recession.¹⁹

<i>Market shares USA: 1993</i>			
<i>Fast food products</i>	<i>\$ Billion</i>	<i>Full-service restaurants</i>	<i>\$ Billion</i>
Hamburgers	40.26	Casual/theme	39.04
Pizza	16.59	Family dining	34.27
Chicken	8.57	Fine dining	6.71
Sweets	8.18	Cafeterias	3.99
Sandwiches	5.89		
Mexican	4.56		
Seafood	2.08		

Source: R.I. Market Forecast 1994, 'Fast food growth by menu category' and 'full service growth by style of service', *Restaurants and Institutions*, January 1994.

6. Food services in Japan

Japan was the second largest consumer market for commercial food services with sales in excess of US \$174 billion in 1991, 23.6 per cent of the world total. Per capita expenditure on food services was almost of \$1410 and it has been estimated that the average Japanese family spent 15–16 per cent of its income on food taken away from home. Sales have grown consistently by 4 per cent per annum²⁰ and the density of restaurants is higher than in any other country.

This demand stems from the importance attached to food service in business and social relationships with the purity and freshness of food

<i>Commercial Food service market shares 1991</i>	
<i>Establishment</i>	<i>%</i>
Restaurants	62.0
Sushi shops	16.8
Noodle shops	9.0
Fast food/takeaway	6.2
Hotel restaurants	4.0
Others	2.0
TOTAL	<u>100.0</u>

Source: Euromonitor Market Direction Report 15.2, 'Consumer catering, strategic management overview: Japan', Euromonitor, 1993.

and the artistry of its presentation being highly rated. Restaurants range from *Kaiseki* haute cuisine in a *ryotei* open only to regular customers to specialised *sukiyaki*, *shabushabu*, *sushi*, *tempura*, *teriyaki*, *yakitori* and *noodle* shops and bars.²¹

7 Design characteristics

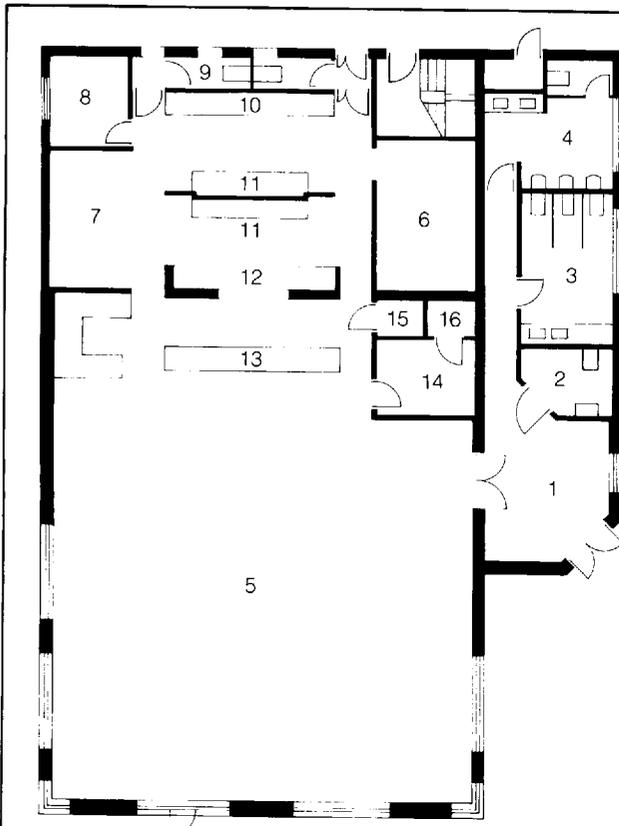
7.01 Evolution of restaurants and bars

Places serving food and drink as a business or trade date back to the very beginnings of organised societies. In ancient Greece every city had its bars and wine shops with their associated salons, and vendors of wine and food plied their cheaper trade in the market places. The expansion of Roman cities and greater travel led to the development of a wide variety of eating and drinking places: the *hospiteum* – providing hospitality and lodgings for visitors; *caupona* – inns and lodging houses; *thermopolium* – snacks and hot drinks; *popinae* – hot restaurant meals; *tabernae* – bars and taverns.

In the Middle Ages, the main providers of lodgings and food for travellers were the monasteries, hospices, guesthouses and hostels operated by the religious orders. Travellers and pilgrims were also catered for by roadside inns and taverns.

Changes in methods of transport also brought with them their specific requirements for food and lodgings: the expansion of coaching inns from the 1790s; the development of the Grand Hotels by railway companies and the holiday resorts made accessible by rail from the 1900s; the introduction of the road house of the 1930s; and the modern hotels and motels of the post-1950 era of international travel are all examples of development made necessary by change.

In addition to continuous advances in the design of restaurant and cafeteria facilities in airports, and rail stations, road travel has given rise to specialist services (motorway stations, *relais des routiers*), family restaurant chains ('Little Chef', 'Happy Eater') and the American Diners.



Ground floor plan

Key

Restaurant facilities

- 1 Entrance lobby
- 2 Toilets: disabled
- 3 female
- 4 male
- 5 Restaurant seating

Food: preparation and service

- 6 Dry store
- 7 Cold store
- 8 Staff room
- 9 Staff toilets
- 10 Wash-up
- 11 Food preparation
- 12 Cooking
- 13 Service
- 14 Manager
- 15 Cleaning store
- 16 Electrical gear

The Happy Eater

A highly popular chain of roadside family restaurants catering for all kinds of travellers, the Happy Eater is recognised by its distinctive logo and style. The basic layout and building structure are also largely standardised but with some variation in individual designs.

There is a manager's flat on the first floor.

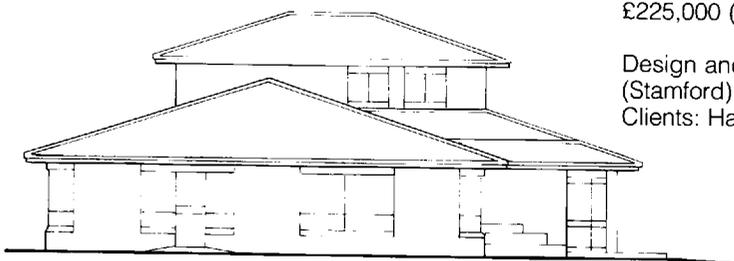
Of the net 300 m² building enclosure at ground floor level:

restaurant seating area occupies	46.2%
storage, preparation, servery and staff facilities	37.5%
entrance and public toilet facilities	16.3%

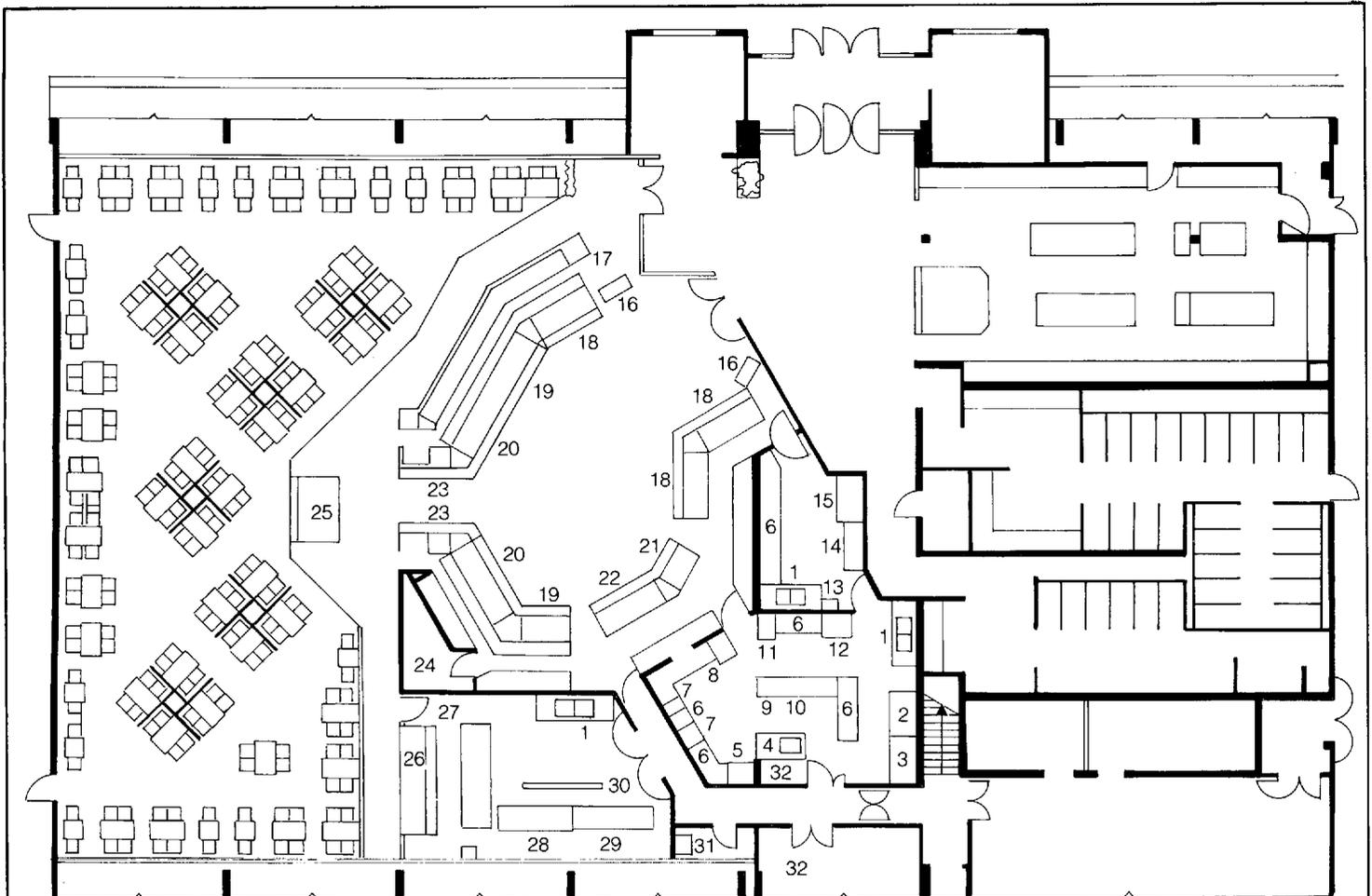
Car parking is provided for some 35 cars and a protected area for children's play.

Units are constructed under a design and build package within 16 weeks at an agreed budget of £225,000 (1994) excluding site costs and fittings.

Design and construction: Alpha Construction (Stamford) Ltd, Simons Design and Build Ltd
 Clients: Happy Eater Restaurants



Front elevation



Kitchen

- 1 Double sink
- 2 Refrigerator
- 3 Freezer
- 4 Sink
- 5 Double oven
- 6 Tabling
- 7 Fryer
- 8 Serving hatch
- 9 Microwave oven
- 10 Grill
- 11 Ham oven
- 12 Boiling table

Cold preparation area

- 13 Wash-hand basin
 - 14 Racking
 - 15 Fridge-freezer
 - 6 Tabling
 - 1 Double sink
- Servery**
- 16 Trays
 - 17 Baby chairs
 - 18 Cold food counters

- 19 Cold drinks
- 20 Hot drinks
- 21 Carving table
- 22 Hot food
- 23 Cash tills
- 24 Operations room
- 25 Cutlery counter

- Wash-up area**
- 26 Pass-through hatch
 - 27 Stripping table

- 28 Dishwashing machine
- 29 Cleans tabling
- 1 Double sink
- 31 Cleaner
- 32 Refuse

Restaurant

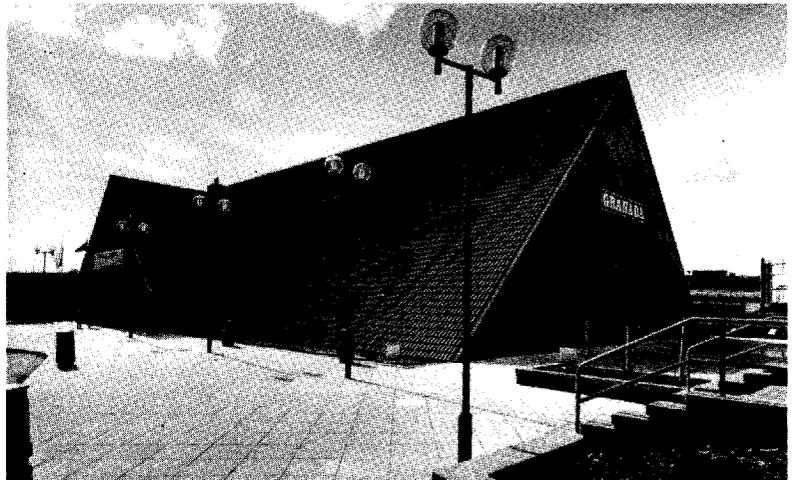
4-seater tables	43
2-seater tables	14
Total seats	200

Ferrybridge Motorway Service Area

Providing self-service, with two counters in use during peak periods, the restaurant was originally designed for 200 covers. After the initial six months operation a new 5 m wide bay was added to give an overall capacity of 300 covers.

Fixed cruciform screens divide the floor spaces into smaller units and provide a plinth for uplighter frames which are readily accessible for bulb replacement and eliminate the need for wiring into roof construction.

Architects and interior designers: Dry Butlin Bicknell Partnership
 Clients: Granada Motorway Services



Increased international tourism and migration have also influenced the introduction of ethnic food and different styles of restaurants.

7.02 Inns, taverns and public houses

The early Saxon ale house, or *ghildhus*, advertised itself by an evergreen bush attached to a pole and later ale houses, inns and taverns adopted similar easily recognised signs for a largely illiterate population. These often represented manorial coats-of-arms or royal symbols as a sign of reliability. Inns and taverns were also the common meeting-places for local people, for bartering, trade, blood sports and gambling. Many were run by women brewsters – the origin of the present Brewster Sessions for pub licensing in England.

Where a tavern provided an eating place, this was usually called a chop-house or chop-room from which has evolved the concept of the grill-room in hotels and the modern steak-bar.

The development of public houses in England was encouraged by the Beerhouses Act of 1830 leading to a proliferation of both country pubs and urban bars. In the last twenty years, particularly, brewery ownership has been rationalised and many pubs now offer either counter meals or full restaurant facilities (see Chapter 10, section 5).

Depending on their origins, pubs may emphasise their historical rustic character or the Victorian-Edwardian sophistication of the later town houses. Traditional design is also usually characteristic of the Italian *taverna* and French *auberge*.

With the increase in gin drinking in the nineteenth century, many of the town taverns developed into gin shops or sophisticated gin palaces from which evolved the music hall. The flamboyant rococo styling which was characteristic of the palace era has been carried forward into the modern design of casinos, saloons and cocktail bars.

7.03 Coffee shops, cafés and clubs

Following the introduction of coffee in the seventeenth century, coffee houses became fashionable meeting-places for gentlemen to debate and transact business. Lloyd's Coffee House, the first to be opened in the City of London in 1652, became the centre for shipping insurance and by 1683 there were estimated to be some 3,000 coffee houses in London alone.

Many inns followed the same fashion by converting one of their public rooms into a coffee lounge, leading to the development of the hotel coffee shop as an informal restaurant open for long hours, serving a set menu of light meals and refreshments for travellers.

Some of the early coffee shops changed direction and became gentlemen's drinking and



(a) The Palm Court



(b) The Chukka Bar.

The Langham Hilton, London

Sensitive restoration and extension over a five year programme, 1987–91, to recreate the opulent style of the original 1865 Grand Hotel

Interior Design: Richmond International

Architects: Ralph Halpen

Clients: Hilton International

gambling clubs with the subsequent formation of gentlemen's clubs – such as the Athenaeum (1815) and the Reform (1836) – and the later

introduction of licensed private clubs for gambling.

Working men's clubs were largely founded by the Victorian reform movement to counter the influence of the gin shops and beer houses and registered members clubs now comprise a large sector of the food service industry.

Coffee was first introduced into Paris in 1669 by the Turkish ambassador and encouraged the rapid popularity of cafés as places for informal gathering where light meals and refreshments were also served. The same concept has been expressed in the development of more dainty tea rooms and later variations, such as patisseries, targeted more towards the female markets in shopping areas. Specialist American style coffee bars enjoyed a brief spell of popularity in the 1950s and this role is continued in present-day snack bars and beverage counters.

7.04 Restaurants

The first restaurant is believed to have been opened by a M. Boulanger in Paris in 1765 supplying a restorative *bouillon* at a high price which attracted an exclusive clientele of both sexes. With progressive extension of the menu, restaurants rapidly became fashionable as a high-class alternative to drinking taverns.

Following the French Revolution of 1789 many of the chefs from the houses of aristocracy became restaurateurs both in France and abroad and the range of restaurants widened to offer set meals as well as *à la carte* dishes, thus establishing the reputation of classical French cuisine.

Although there are many kinds of restaurants, high-class establishments tend to be conservative in design, providing a setting of quiet elegance to complement the quality of the food and wine.

The menu, preparation and service of food are also often in the traditional French style although with a trend towards lighter, healthier meals (*nouvelle cuisine, cuisine minceur*).

7.05 Trattorie

Italian eating places vary considerably in quality and style but outside Italy the trattoria has come to be identified with a trendy restaurant offering a variety of traditional and popular Italian dishes – sometimes combined with gueridon service – and with a good selection of wines. Characteristically, the service is friendly and the atmosphere informal and lively.

7.06 Bistros

The word 'bistro' is said to derive from the Russian 'bystro', or 'quick', supposedly shouted by the soldiers occupying Paris in 1815. As a café or small restaurant the 'bistro' came into fashion in Paris in the 1940s and is usually interpreted as a

relatively unsophisticated eating place for young executives and professionals which offers a daily variation of individual dishes and wine in an informal social atmosphere.

Wine bars are a similar but usually more stylish meeting-place giving more emphasis to the range of wines, cheeses, etc, although with a limited menu. Specialist gourmet dishes – including home-prepared food – may also be featured.

7.07 Brasseries

Dating back to the mid nineteenth-century, the Parisian brasserie is strictly a restaurant-bar serving a variety of beers with a complementary and, usually, extensive range of food. The style of design and atmosphere are traditionally Parisian. Comparable developments include the pub-restaurant in England and *Bierhallen* in Germany.

7.08 Ethnic restaurants

Tourism, migration, media coverage and individual experimentation have all contributed to the increasing interest in ethnic foods.

Ethnic restaurants are generally considered to specialise in non-European food, particularly Asian and Oriental. Depending on the markets, the traditional foods and methods of preparation may become modified to suit Western tastes but the character is often expressed in the design of the premises and the rituals of food presentation and service.

7.09 Buffets, butteries and cafeterias

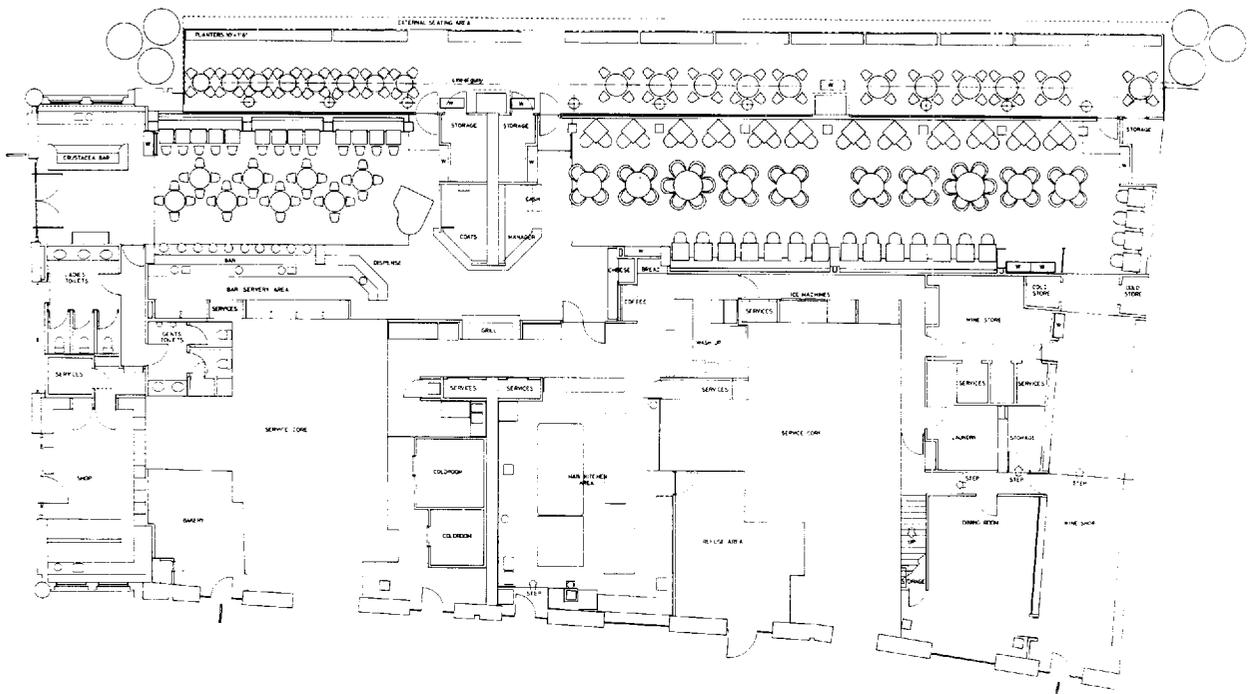
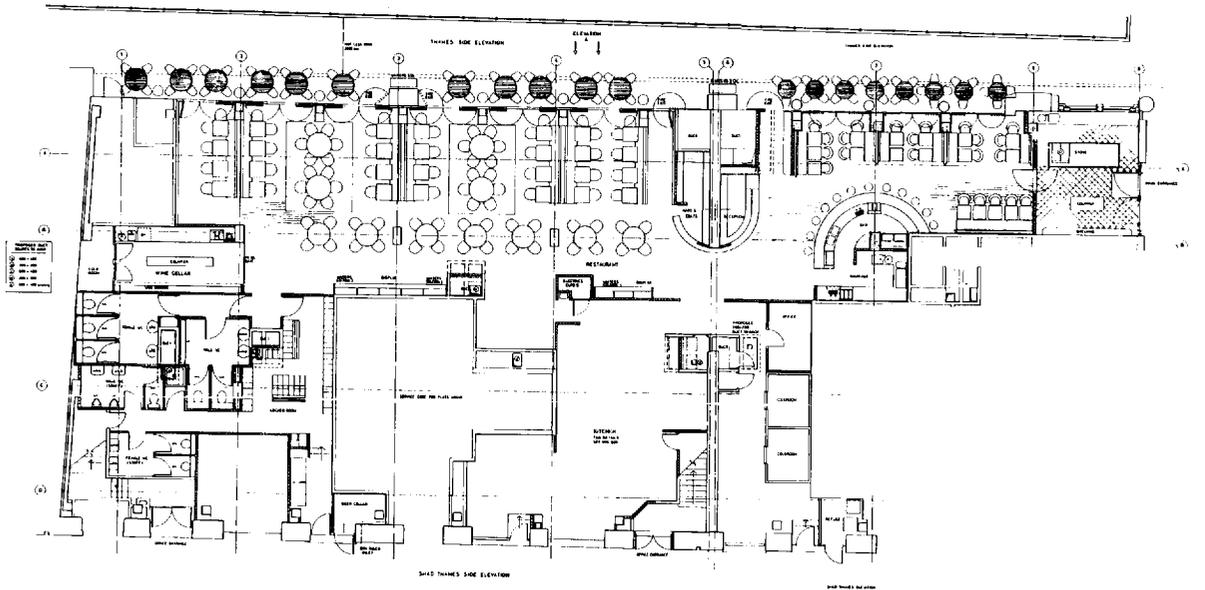
Many food service operations allow customers to help themselves from a choice of food attractively displayed. Buffet-style service is used in hotels

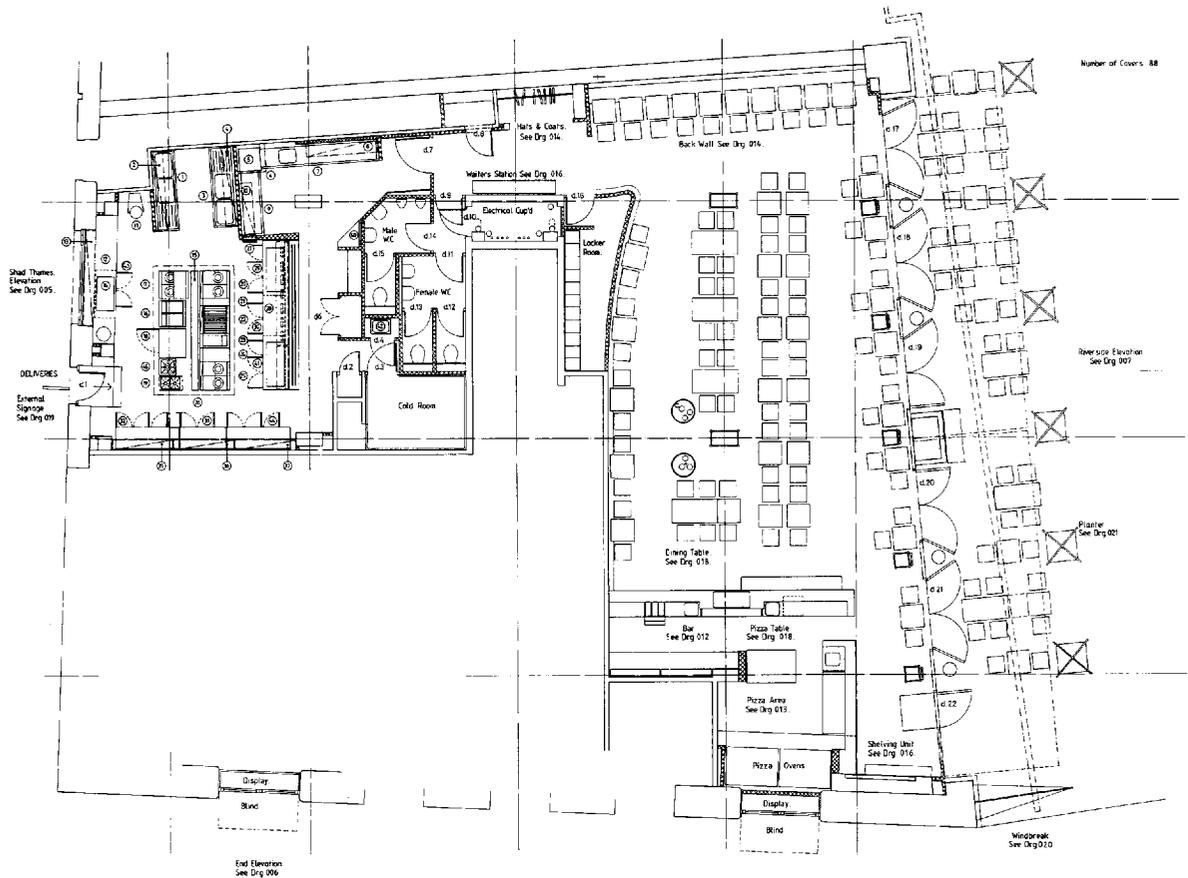


Borsalino Trattoria, Malta

A green and white decor emphasises the informal atmosphere of this café-bar.

Design consultants: Edwin Bonello and Associates





Butlers Wharf Chophouse, Le Pont de la Tour, Cantina del Pont, Butlers Wharf, London

These are three adjacent quality restaurants occupying the ground level of an apartment office building at Butlers Wharf fronting the River Thames. Each of the restaurants is based on a different concept with its own individual style. All restaurants can spill out into canopied terraces and feature views into the kitchens from outside and inside the building. Designs by Sir Terrace Conran, Keith Hobbs, Linzi Coppick

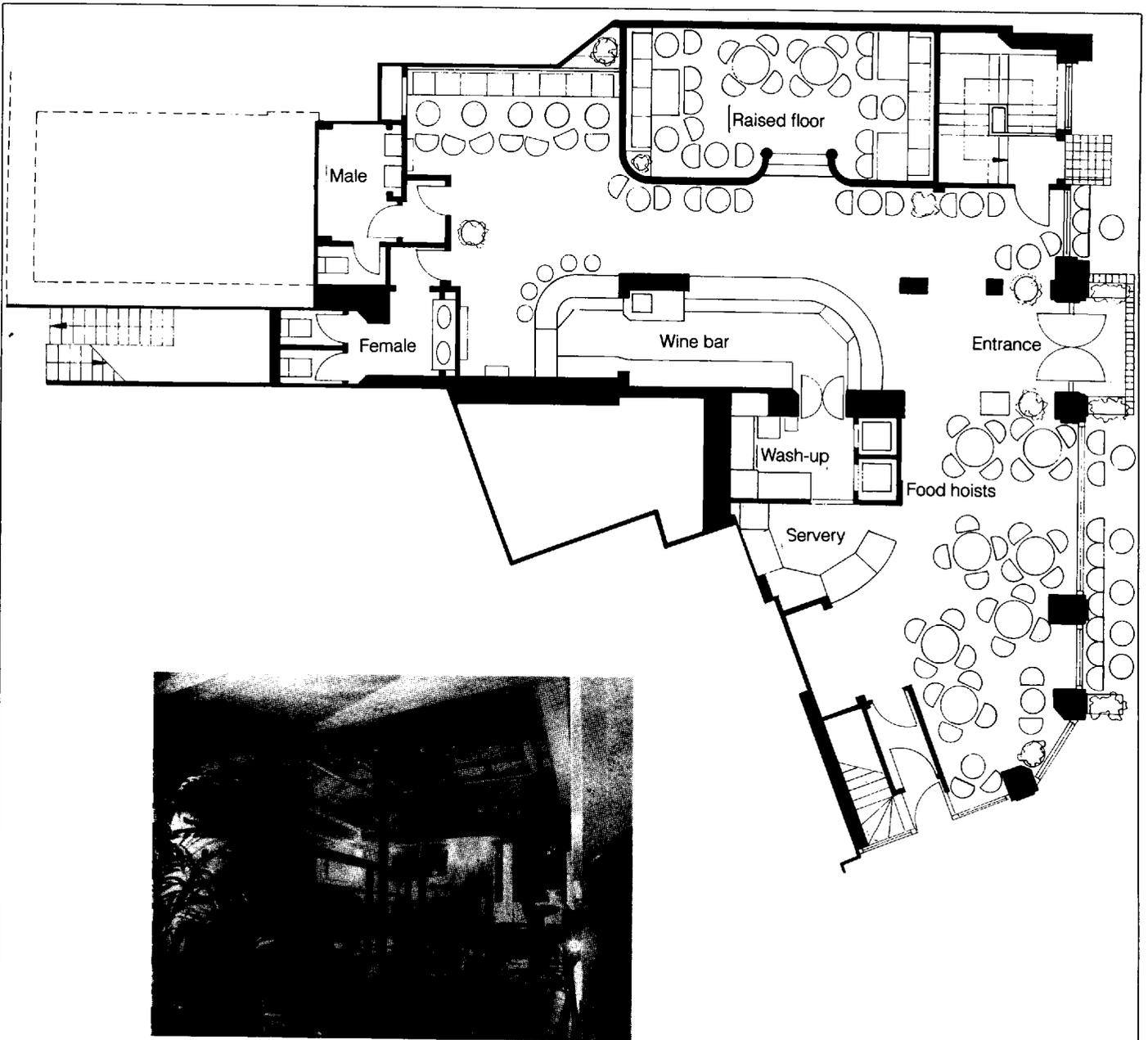
(a) and (b) Butlers Wharf Chophouse serves a traditional English menu and is divided into bar and

restaurant areas. The 167 interior seats are a combination of booth seating with circular tables for 4 and 6.

Restaurant area:	307 m ²	Seats:	167
Area/seat:	1:84 m ²	Total area:	545 m ²
Total seats:	240	Overall area/seat:	2.27 m ²
Restaurant area	56.3%		
Public toilets	5.6%		
Staff facilities	9.7%		
Wine and beer stores	5.1%		
Kitchen	14.5%		
Cold stores	8.1%		
Refuse and delivery areas	0.7%		
	<u>100%</u>		

(c) and (d) Le Pont de la Tour is mirror image in plan but a more sophisticated classical design. There are 159 seats in the restaurant and piano bar with 72 under awnings outside.

(e) Cantina del Pont offers a third style based on a Mediterranean theme and featuring a huge wall mural depicting a harbour scene. In addition to the main kitchen, the design includes a speciality pizza bar.



Oriol, Sloane Square, London, SW1

This stylish brasserie in Sloane Square is the result of a major conversion of a run-down public house in one of London's prime locations.

The designers have sought to evoke a French-North African theme in the styling of the interior and graphics, while the drinks and catering operation has a definite Parisian character. Oriol is open all day serving breakfast, lunch, tea and dinner, alcoholic drinks being available during licensed hours. Food prepared in the first floor kitchen is delivered via a hoist to the ground-floor servery. The shopfront may be opened in fine weather to provide pavement service – a popular feature in this fashionable area – while inside seating is necessarily crowded to create a social atmosphere. The lighting within the rooflight above the raised seating area provides a changing mood through the day.

Plan of restaurant

Clients: Imperial Inns & Taverns
 Architects/designers/graphic designers: Carmona
 Dover

and restaurants where the price is inclusive and for purposely designed operations such as the salad bar, carvery and chef's table, where assistance is usually provided.

Butteries and grill-bars are permanent servery counters in which individual dishes can be cooked to order. The menu and equipment may be specialised, as in sushi bars, barbecues and rotisseries.

The cafeteria also allows self-service from a counter line with the items individually priced and this has been developed into the free-flow or foodhall system of individual counters.

For self-service, the layout is largely planned around circulation to and from the service counter and the display itself is a prominent feature of design.

7.10 Snack bars and sandwich bars

Snack bars overlap with many other counter-style operations (café-bars, estomets, fast-food units, food kiosks and stands).

As a rule the menu is limited to cold snacks (sandwiches, pastries) with simple hot dishes which can be prepared to order on small back-bar equipment within the servery area.

Upmarket variations include the delicatessen, sandwich bar and patisserie.

7.11 Fast food

The term 'fast food' applies to any system-based operation providing a limited range of highly standardised products which can be eaten on the premises (usually 'finger-held') or taken away. Although this concept dates back to the origins of street vending, the development of a total system approach to control the production and service of freshly cooked food in restaurants is relatively new.

Fast-food operations may be based on any food which is consistent in composition and quality but are at present mainly limited to burgers, fried fish, pizzas and fried chicken.

Market (a)	Product	Service style (b)	Types of restaurants			
			Haute cuisine	Traditional high-class restaurant	Steakhouse Seafood restaurant	High-class speciality restaurant
Up-scale	Individual sophisticated design Emphasis on personal choice and service	Gueridon service	Haute cuisine	Brasserie Trattoria, Pub restaurant, Wine bar	Steakhouse Seafood restaurant	High-class speciality restaurant
Mid-scale		Silver service				
	Buffet service	Nightclub Function Buffet	Grill bar Rotisserie Coffee shop	Ethnic restaurants (European/Mexican, etc)		
	Family service	Private dining parties			Café	Food hall
	Emphasis on social atmosphere	Counter and table service	Family restaurant Diner Store restaurant Employee feeding	Patisserie		
Popular	Plated table service	Pub-counter food	Snackbar Sandwich bar		Specialised menu	
Economy	Emphasis on convenience and value			Self-service cafeteria		Drink oriented
	Standardised functional design	Counter and take-away service	Conservative	Innovative		
		Menu range			Limited menu	
		Design emphasis				

(a) Market classifications – Chapter 3, section 4.03.
 (b) Service styles – Chapter 9, section 1.03.

Compared with most other restaurants, fast-food stores are capital intensive, requiring specialised equipment and a standard design of premises.

7.12 Merchandising role

Restaurant design must accurately represent the type of establishment and its standards of sophistication and price while, at the same time, indicate the differences which distinguish it from competing premises. Essentially, the design must complement the style of operation and be seen as part of the overall experience. This product merchandising is particularly important in speciality restaurants and fast-food units where the service style is an integral feature of the design.

7.13 Classification

As indicated in section 1.03, the range of facilities provided for food and beverage service is extremely wide, being mainly determined by differences in market demands and varying in size, standards and occasions of use. To establish guidelines for design requirements it is useful to classify restaurants into different types and, in this context, the most important distinctions are:

- *menu*: full or limited menu, extent of product specialisation,
- *service style*: table service, cafeteria or counter service including take-away or carry out meals,
- *market orientation*: average spending power, individuality of design, extent of personal service.

Although there are many exceptions, the main characteristics of restaurants can be broadly represented by a multiple scale (see page 19).

7.14 Life-cycle changes

Both the design of restaurants and their descriptions are constantly changing as new concepts are introduced or adapted and as the market requirements change generally or in a particular locality.

As a rule, the profitable life of a restaurant concept is limited. In some cases the location of the premises may be favourable to new investment in refurbishment while, in others, a detrimental change in the character of the neighbourhood or in the market demand may make this unfeasible.

Apart from major changes in the market potential, the design life of a restaurant concept may be determined by other influences:

Impacts on design	Influences
Changes in fashion	Modes in domestic furnishings, styles, materials, art forms and interior design generally
Consumer response	Social trends, changes in attitudes, life styles, meal patterns, spending power
Competition and innovation	Copying, direct or indirect competition with similar products, advertising and promotion
Management policy	Development of new concepts, changes in emphasis, market re-orientation
Obsolescence, wear and tear	Replacement of furnishings and equipment to restore standards

Type of establishment	Median life cycle (a) (years)
Traditional restaurant, ethnic restaurant	7
Hotel coffee shop, speciality restaurant	5
Innovative designs, fast-food units	4
Cafeteria (redcoration/renovation)	5–8
Food production equipment	7(b)

(a) Periods between extensive refurbishments.

(b) Affected by obsolescence and cost of maintenance.

8 Trends and developments

8.01 Influences affecting the demand for meals outside the home

Changes in the pattern of demand for meals outside the home may be:

Demand led – due to demographic, social and economic changes in particular areas and external influences (fashion, travel, consumer education, legislation);

Supply led – arising from promotion, rationalisation, competitive developments in operational practice, introduction of new concepts.

Most of the main consumer food service markets in America and Europe are relatively stable because of their size and diversification. Overall growth is forecast to be in line with general population and economic trends.

8.02 Influences on food services in the UK

Changes affecting future demands in the UK, largely parallel those in Western Europe and North America. The main influences – based on 'social trends', population censuses and other indicators – may be summarised:

(a) *Changes in population age structure*: between 1991 and 2001 the numbers in the mature age groups, 40–64 are projected to increase from 16.5 to 18.1 million (+9.7 per cent) while those aged 16–30 will reduce from 20.3 to 19.3 million (–4.9 per cent). This is reflected in a demand for wider variety in meal choice, more orientated towards 'adult' markets.

(b) *Changes in family groups*: recent rises in the birthrate will increase the under 16 year old population from 11.7 to 12.6 million by 2001 (+7.7 per cent) affecting family budgets. Increases are also forecast in the number of one person households with limited means.

(c) *Economic recession*: the long term effects of economic recession are shown by a general trading down to cheaper meals with greater emphasis on value for money. Industrial and institutional food services are increasingly subject to cost competition, rationalisation and introduction of commercial practices.

(d) *Changes in spending power*: with progressive improvements in the economy and larger numbers of couples and families having multiple incomes, discretionary expenditure on leisure and eating out is expected to rise.

(e) *Influences of immigration and tourism*: ethnic restaurants attracted almost 9 per cent of the total commercial food service expenditure in 1991–2 with 26 per cent of the market for restaurants/cafés and 10 per cent of that for the fast food/takeaway segment.²² Further growth is projected with increasing ranges and variety of food.

(f) *Preferences for shorter, informal meals*: changes in attitudes are shown by the increasing number of one and two course meals; by the wider flexibility in meal times and increasing acceptance of finger-held foods and disposable packaging.

(g) *Food service systems*: the competitive advantages of systems based operations are set to continue the growth of fast food and popular restaurant chains through franchise, licence or direct company investment.

(h) *Brewery chains*: with demerger of brewery and operating companies, there is a continuing expansion of pub food and restaurant concepts in public houses.

(i) *Dietary changes and legislation*: increasing concern about health and standards of nutrition has led to the introduction of health foods, vegetarian foods and products with low saturated fats and salt content. Changes brought about by legislation such as the *Food Safety Act 1990*, EU directives on employment, training requirements and access for the disabled will also have an influence on design.

8.03 Influences on food services in the USA

Broadly similar changes and trends have been reported by the US Census Bureau and Department of Commerce, the National Restaurant Association,²³ Restaurants and Institutions Surveys²⁴ and other agencies.

(a) *Demographic changes*: shifts towards older age groups coupled with recent higher birthrates and increasing ethnic populations have implications for future market target targeting and employment.

(b) *Consumer pressures*: the strengths of consumer representation has led to improvements in standards of hygiene and menu description in addition to increasing sales of health food, vegetarian and ethnic needs.

(c) *Commercial influences*: competitive advantages in promotion and pricing together with investment facilitation are extending the rapid development of franchised operations. Fast food counters and kiosks are being added to food courts, retail stores and employee food services. US groups are also looking forward towards growth markets overseas.

(d) *Extension of technology*: much of competitive expansion of food service chains has resulted from the higher efficiency of systems based technology. Further development of computer optimised management systems and increasing automation of equipment is expected.

8.04 Influences on food services in Europe

The trends in population and social changes in the UK are also evident in Western Europe. In most European countries there is a strong tradition of small family restaurants and social values are more highly regarded. Although the major international groups have achieved some penetration, particularly in Western Germany, many of the fast food concepts are adapted to regional tastes.

Developments in chain operations in Europe have tended to be linked with large retail organisations. Catering networks have also developed with highway services, such as Courte Paille (France), Autogrill (Italy).

8.05 Trends in chain operations

Fast food and popular chain operations are responding to competition, increasing costs and product fatigue in several ways:

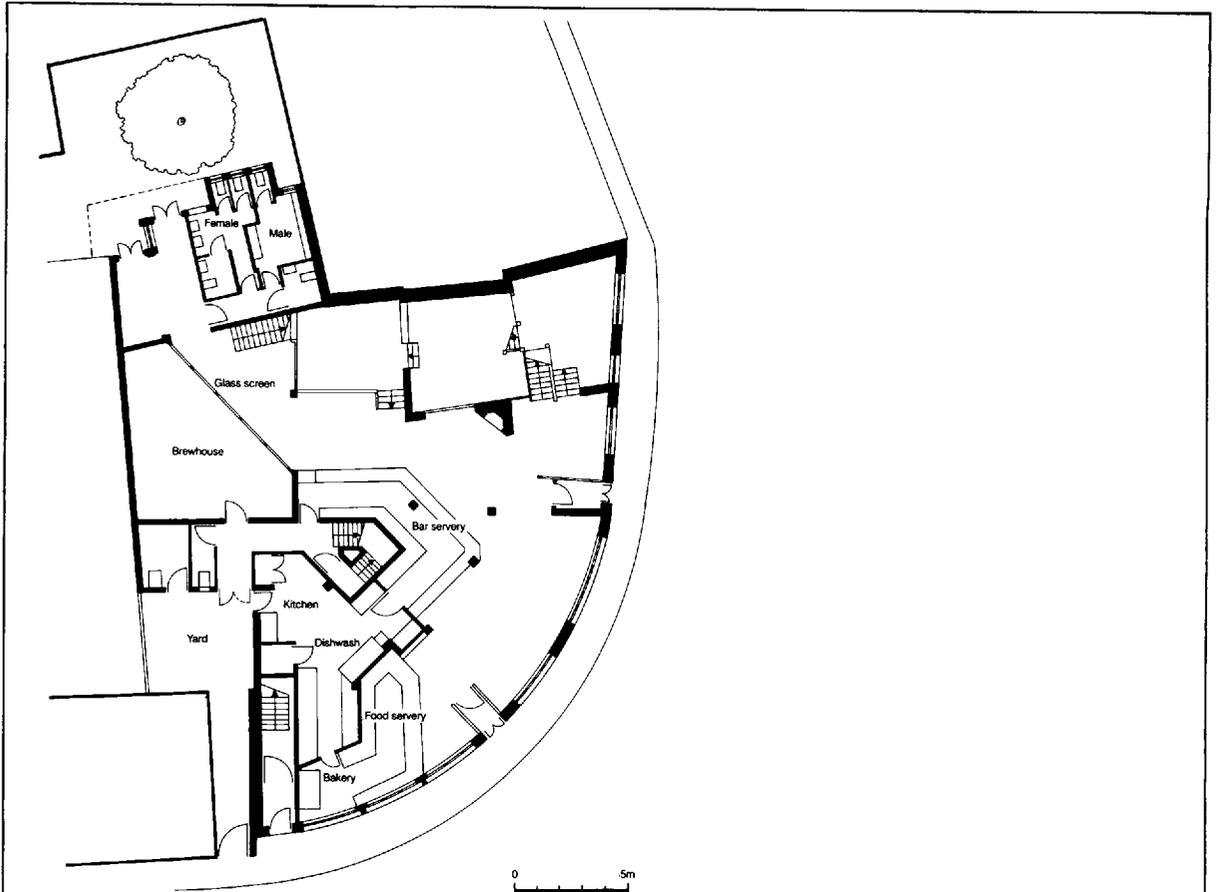
- prime high street units are increasing in size and investment to generate the market impact and large volume sales necessary to finance rents; most provide alternative dining areas and party rooms.

- fast food and delicatessen concepts are also expanding into 'pubs', retail stores, employee food services and all areas of transport catering, using self-contained counter service or vending units.

- in 'sensitive' areas the design of units is being fitted into the environment.

- new styles of decor are being progressively introduced to create a light, fresh and natural domestic image.

- variety is being widened with carefully researched additions to the product range, including the expansion of breakfast and brunch meals, party menus and home delivery services.



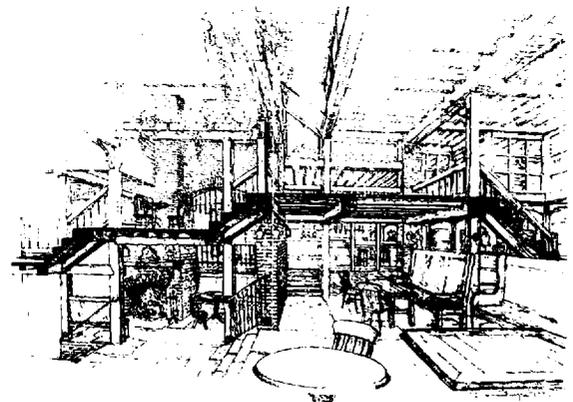
The Bakery and Brewhouse, Oxford

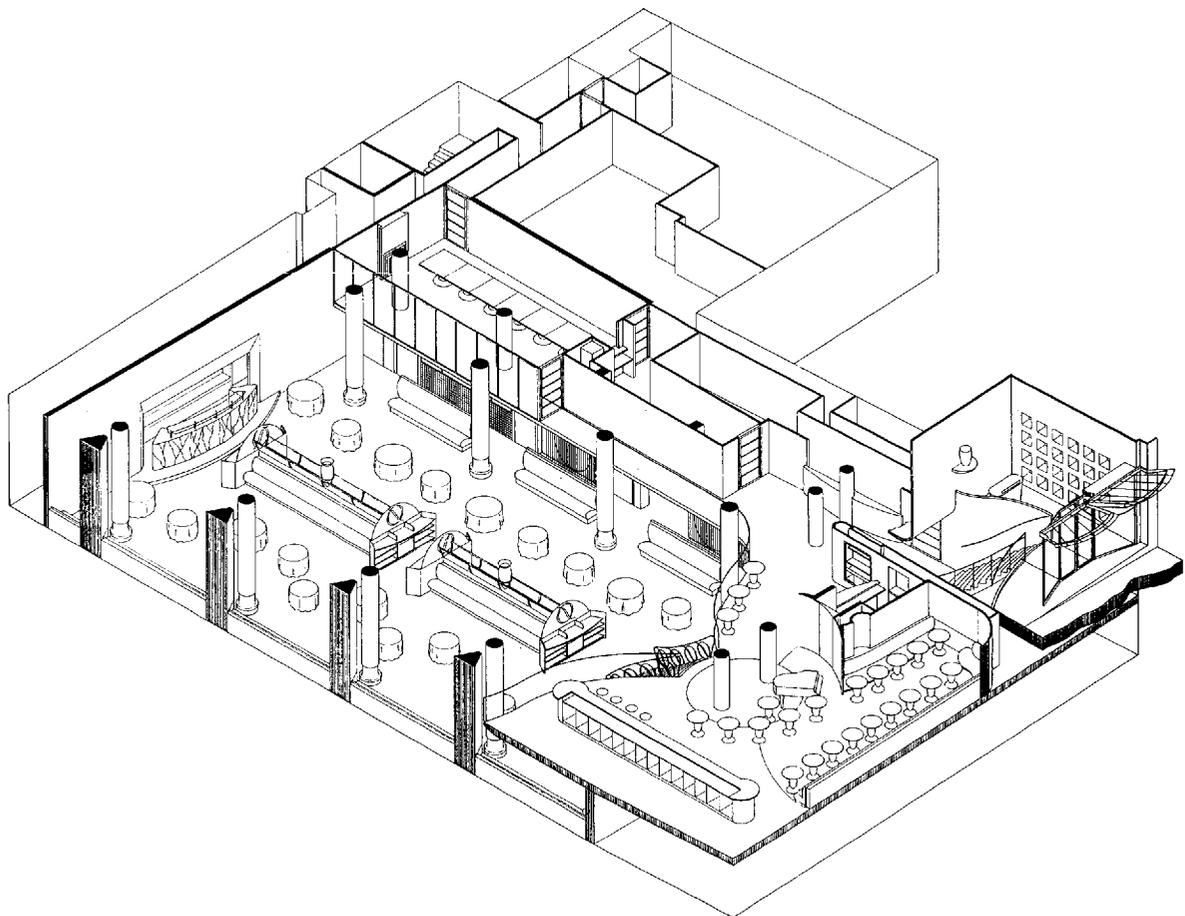
This new public house has been formed from a number of existing buildings in a redevelopment area.

The objective was to provide authenticity in a traditional setting with the advantages of modern equipment. Reflecting the interest in real ale and home cooking, the visually linked areas include a brewery and bakery, and cellar space has been converted to extend the bar area. The overall drinking area is about 260m². Completed in 1984.

Plan: ground floor.

Architects: David Cheyne and Paul McIntosh
 Clients/owners: Halls Oxford and West Brewery Company Ltd, a division of Allied Breweries



**Quaglino's, St James, London**

This is an innovative basement restaurant which offers three separate eating areas including Brasserie and Mediterranean concepts. With ornamental bronze and nickel metalwork complementing mosaic and marble linings. The atmosphere is lively and sociable. The basement features views into the kitchen and a false skylight with simulated skies which change day and night.

Design by Sir Terrance Conran, Keith Hobbs, Linzi Coppick
Axonometric plan

8.06 Trends in design

Restaurant design is concerned with two main objectives: to provide the customer with an experience which is satisfying and enjoyable, and to meet operational targets in terms of the volume of sales, cost control and efficiency. Creative design involves a very wide range of different interpretations depending on the type of premises, market requirements and company objectives. Statutory requirements (hygiene, safety, licensing, access for disabled) also influence the layout, choice of finishes and equipment. Some of the general trends include the following:

- display of showmanship in preparation skills (sushi bars), cooking (barbecues, grills, traditional ovens) and serving (chef's tables);
- introduction of new foods (traditional regional dishes, wider ethnic ranges, wholesome food recipes) with emphasis on 'atmosphere' and characterisation; increased choice with self-service salad and fruit counters, breakfast bars, starter carousels, assisted buffet tables;
- creation of garden settings with greenhouse extensions, fountains, planted areas and internal patios served by kiosks or carts;
- distinctive styling of coffee shops and upscale cafés using art nouveau, memorabilia and other themes;
- individual design of trend-setting bistros, pubs and wine bars with emphasis on ambience orientated towards young professionals;
- characterisation of eating places in converted buildings, restored monuments and unique settings;
- development of retail malls and foodcourts incorporating a variety of speciality restaurants and dual restaurant-delicatessen or bakery concepts;
- association of restaurants and cafés with recreational facilities providing profit centres overlooking areas of visual interest and activity;
- extension of the English 'pub' catering concepts into other countries.

8.07 Trends in production and control

The development of systemised production to serve fast food operations has had wide ranging impacts on the design of food service equipment generally. Integrated systems have also evolved to meet the more specific requirements of large scale production, distribution and control which apply in many institutional and industrial food services.

Current trends in operation and production can be broadly grouped into four main areas:

- separation of preparation and primarily (bulk) cooking from the end cooking and service requirements (in place, time and equipment) using *cook-chill* or *sous-vide* systems, frozen or freshly prepared foods;
- improvements in cooking equipment,

efficiency and performance with self-monitoring programmed controls, combinations of cooking processes, conveyerised and mechanised equipment, automatic regulation, energy conservation and heat recovery;

- facilitation of cleaning and hygiene with cantilevered suites and modular fitted equipment, controlled surface temperatures, self-cleansing interiors, and removable components;
- widescale use of micro-computers in process control, performance measurement, market production, accounts, production schedules, employee management, inventory control, maintenance programmes, energy monitoring and remote station networks;

Current trends in technical equipment are indicated in chapter 8.

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2

The Business Framework

1. Establishing a restaurant or leisure business

1.01 Business opportunities

Compared with other business ventures, starting up a restaurant appears to be relatively easy. The legal formalities are minimal and often involve little more than acquiring a property and, in some cases, registering or licensing the business. Capital investment in leased premises and equipment can be spread out and many of the more expert requirements of design, maintenance and financial accounting can be contracted out.

Catering is seen as an art which can be developed from domestic experience, and the skills of cooking, service, purchasing and organisation can be learnt – to some extent by experimenting. It is also a business in which many members of a family can participate.

The realities of the situation are often different: it is not uncommon to find there is no significant demand for the products offered, operating costs are usually underestimated and margins of profit inadequate to reward effort and finance expansion. On the other hand, some restaurateurs are extremely successful: the concepts they adopt meet a specific need and appeal to a sufficient number of customers. This popularity is often the beginning of a new wave of similar developments and the entrepreneurs establish or become part of larger companies with the resources to invest in chain or multiple operations.

Individual investment in restaurant business is facilitated by franchising. Many of the initial commercial and legal formalities of setting up a business are assisted with the experience of the franchiser as a resource.

1.02 Sources of investment

Companies or corporations may invest in restaurants for many reasons: an existing company may wish to

- use its established market channels in a complementary area,
- diversify its business,
- develop a different kind of restaurant operation, or
- introduce a more specific product independent of its other outlets.

New companies are generally created in order to market and develop a new concept or brand image for a particular style of food service or leisure operation.

2. Types of business

Businesses can be operated by a sole trader, partnership or company. Each approach has advantages and drawbacks and it is advisable to obtain both legal and financial advice. Some of the main features can be summarised.

<i>New sources of investment</i>	<i>Examples</i>
Companies with associated interests	In food manufacture, distribution, brewing, retailing, hotel operation
Supplement to other commercial operations	In departmental stores, galleries, airports, theatres, leisure centres
Part of broad-based real-estate investments	In development of multiple shopping-office-leisure projects; joint capital funding with hotel and restaurant companies
City and planning authorities	In conservation schemes for city centres; rehabilitation of preserved buildings; development of tourism in key areas
Restaurant companies	In expansion of restaurant chains; parallel developments in other areas; introduction of new products and concepts
Tourism and recreation development	In holiday villages and tourist resort complexes; hotels; recreation centres
Individual and group investments	In leasing or purchasing premises; taking out individual or regional franchises, licences and concessions; share issues and floatations by companies, joint capital development of land or property

2.01 Sole trader (US – sole proprietor)

This applies to businesses owned and controlled by one person:

- as a rule legal formalities are minimal (except where licences or franchises are involved) but collateral security is usually required in raising finance,
- a sole trader may operate under his own name. If a business name is used, the rules of the Business Names Act 1985 apply. The statutory notice must be displayed and the trader's real name included on all business letterheads, literature, etc,
- the owner and business are treated as one under law and personal liability for debts and losses is not limited,
- taxation is also based on income tax rules – as opposed to corporation tax rates and allowances,
- since the goodwill of the business is built around the individual its saleable value may be limited,
- to provide extra capital to expand a successful restaurant business the owner has usually to look towards forming or combining in a larger partnership or company.

2.02 Partnerships

A partnership may be defined as the relation

which subsists between persons carrying on a business in common with a view to profit:

- partnerships are usually formed to establish better resources (assets, finance, specialist skills). The number of partners is limited to twenty,
- in the United Kingdom, partnerships are subject to the Partnership Act 1890, Companies Act 1985 and the Business Names Act 1985,
- the Partnership Act outlines the rights of partners to participate in the business, share equally in any profits or losses, prevent admission of new partners, examine business documents and receive interest on loans in excess of the agreed subscribed capital,
- these may be modified by agreement or articles of partnership setting out specific rights and duties,
- within the scope of the agreement, the actions of any one partner are legally binding on the others and each is liable jointly and severally for the debts of the partnership,
- partnerships may be terminated after a set period of time or under specified circumstances (death, bankruptcy). They may also be dissolved by request, mutual agreement or because of some illegality,
- special types of partnership may apply: *limited partnerships* (limiting liability), *silent and secret partnerships* (USA).

2.03 Companies

A company is defined as a collection of persons who have combined for some common purpose and who are recognised and treated by law as a person with rights and duties distinct from those of its individual members.

In the United Kingdom, companies may be chartered or statutory or registered. While the first two may operate restaurants and clubs as a service for their employees and the public (travellers, visitors to public buildings, hospital patients, etc) it is the registered company which is primarily concerned in commercial food service or leisure operations:

Today, most companies are formed by registration under the Companies Acts. These requirements are progressively being revised in harmony with EEC legislation,

Registered companies are normally limited by shares, the shareholders' liability for any debts being limited to the nominal value of the shares held. This must be indicated in the name (Ltd, PLC).

2.04 Private companies

These are usually formed from the expansion of small businesses or for the development of new products. A company which is not a public company is a private company (Ltd).

2.05 Public companies

A public company (PLC) is a limited company with a share capital which has a memorandum stating that it is a public limited company and which has been registered as such.

Public companies are free to advertise their shares to the public in order to raise capital and these shares are freely transferable.

2.06 Registration

In the United Kingdom a company is registered when it has submitted specified documents to the Registrar of Companies and has been issued with a certificate of incorporation. The documents include:

- Memorandum of Association,
- Articles of Association,
- statutory lists,
- statutory declaration.

In the United States, a corporate entity is described as a corporation. State statutes governing corporate law vary in what they permit, but all provide for limitation of liability. Normally the corporate name must include the word 'corporation' or 'incorporated' or abbreviation (Inc, Ltd).

3. Franchising

3.01 Basis for franchising

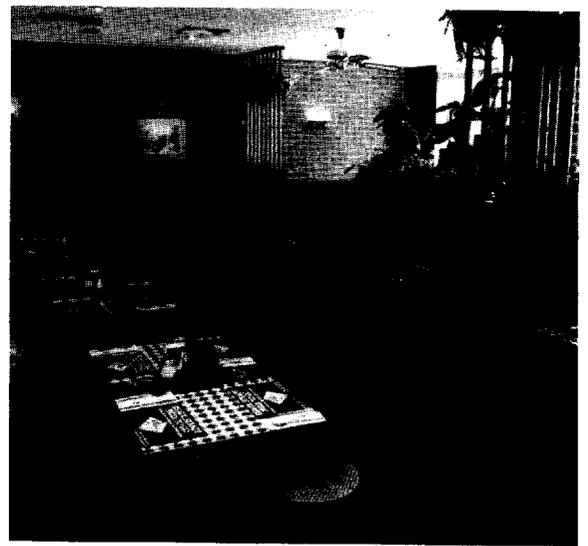
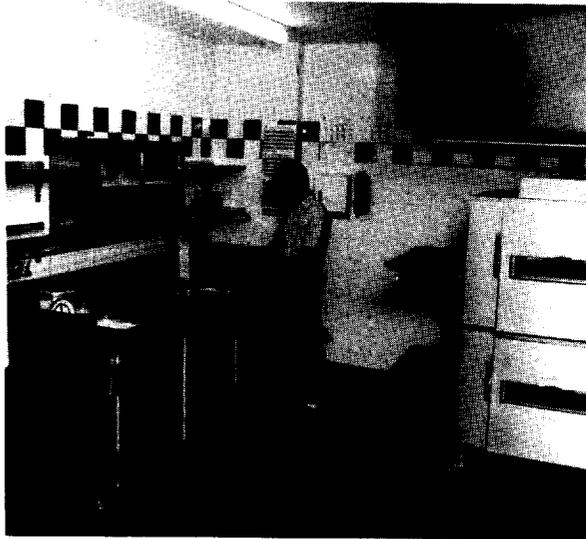
A franchise is an arrangement in which the first party (the franchiser) grants to a second party (the franchisee) the right to use commercial methods of operations and products he has developed, subject to stipulated terms and conditions. Franchising is widely used in the food service and leisure industries – particularly for developing fast-food units – but there is a confusing variety of methods of operation and terminology: franchisees, for example, are referred to variously as dealers, licensees, operators, branches, units and outlets.

The person buying a franchise is typically cited as an individual with a modest amount of capital, little or no experience of self-employment or the business of the franchise, who aims to get into business with a tried and tested formula. In practice, many of the franchises are substantial companies who want a ready-made entrée into a new market without incurring the research and development costs.

3.02 Launching of schemes

Food service franchise schemes are usually launched for one of the following reasons:

- (a) a company manufacturing or distributing food products may want to establish as many sales outlets as possible and to evolve an



Restaurant
(seating 82)

- 1 Screens
- 2 Salad bar
- 3 Booth seating
- 4 Bench
- 5 Dessert

Service area

- 6 Glass wash
- 7 Cash register
- 8 Coffee
- 9 Ice bin
- 10 Dispense

Kitchen

- 11 Cut table

- 12 Oven
- 13 Make table
- 14 Pasta bain-marie
- 15 Pie case
- 16 Baby chairs
- 17 Wash-hand basin
- 18 Salad refrigerator
- 19 Ice machine

Dough batching

- 20 Roller
- 21 Dough bench
- 22 Prover

Retarder

- 23 Retarder
- 24 Freezer
- 25 Flour plinth
- 26 Mixer
- 27 Bench
- 28 Sink
- 29 Pasta cooker
- 30 Cold room

Wash-up area

- 31 Soiled dishes dump
- 32 Rack slide with inset sink
- 33 Corner

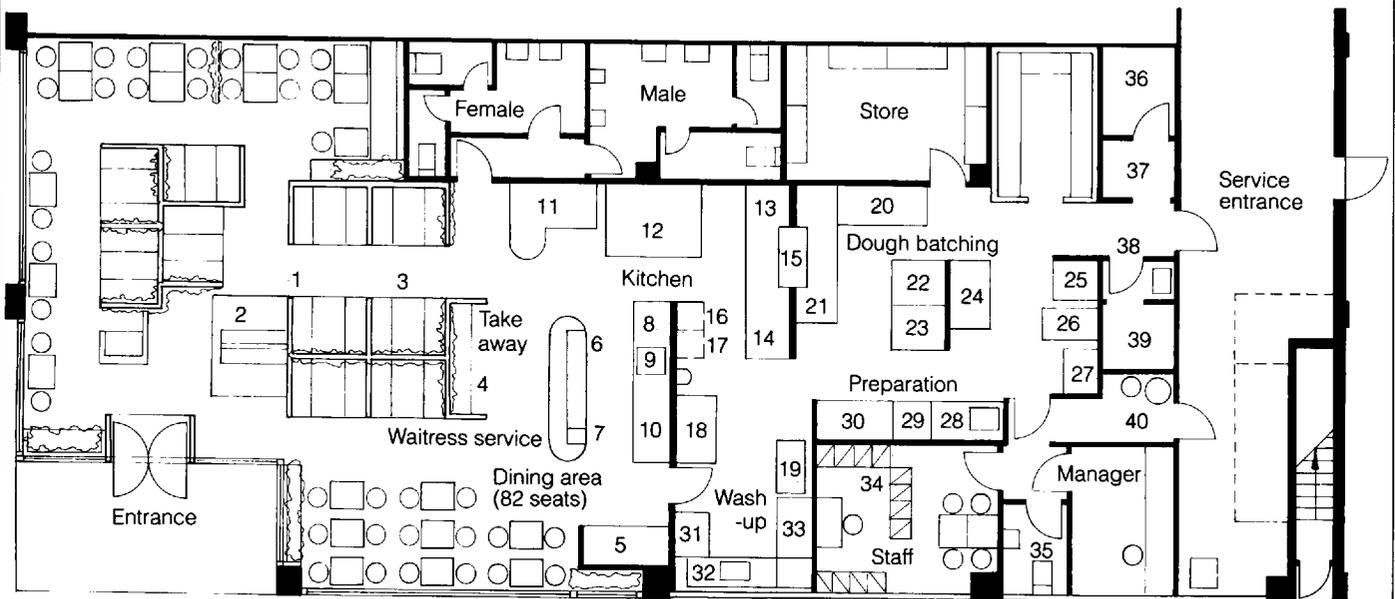
- dishwasher with unloading rack
- 34 Staff lockers
- 35 Staff toilets
- 36 Beer store
- 37 Post-mix sink
- 38 Cleaner's sink
- 39 Refuse
- 40 Water softener
- 41 Boiler

Pizza Hut

Pizza Hut has been successfully developed by Whitbread and Company in the UK as a popular fast-food chain providing both take-away and waited service.

Worldwide, Pizza Hut has some 4,600 units. Units follow a similar layout adapted to suit different buildings and accommodate around 80 seats arranged in booths and as loose furniture. Seating areas occupy about 35 per cent of the total floor area.

Architects: Farrinton, Dennys Fisher
Clients: Pizza Hut (UK) Ltd



exclusive formulation and a sales package (i.e. a restaurant or take-away to a specific design) in which to retail its products,

(b) a company having established a restaurant concept may want to spread it to as many sites as possible in order to

- produce a return from expansion or entry into new markets without risking its own capital,
- gain benefits of scale in advertising, purchasing, etc,
- rationalise its own operation in geographic terms by franchising the marginal sites or opportunities,

(c) a company having invented or evolved a line of preparation or cooking equipment with exclusive features may want to develop a restaurant or take-away package around it in order to gain wider distribution.

3.03 Terms and conditions

Direct financial returns to the franchiser are obtained from one or more of the following:

- royalties on franchise sales (percentage of sales or fixed annual charges),
- setting up fee or opening expenses,
- rental on property occupied,
- mark up on sales of food products to franchisees,
- contribution to central advertising (percentage of sales),
- sales of specialised equipment, branded supplies.

Schemes based on a high fee for the initial agreement or on the sale of equipment are arguably less beneficial to the franchisee than a continuing interest in the success of the business (i.e. sales).

The franchisee

Whichever scheme is employed, the basic stipulation is that the franchisee must put capital towards setting up the franchise – for the building rental, shopfitting, equipment and other supplies. Loans may be available through the franchiser and there are a few licence or tenancy schemes which limit the financial commitment, usually in exchange for a reduced security of tenure. The qualities sought in franchisees are entrepreneurial attitudes, motivation, desire to operate an independent business, maturity, leadership and ability to control operations.

The franchiser

For his part, the franchiser must make a fair contribution to the arrangement by providing a unique concept or product which is difficult to produce (imitate) without special knowledge, which balances the input of effort and service provided by the franchisee and which affords an

opportunity to make an adequate profit within the constraints imposed.

As a rule, the franchiser will need to have a well-established business, a proven reputation and a good knowledge of the requirements in setting up and operating the franchise, i.e. marketing, property evaluation, advertising and promotion, quality control, financial control, business management, training and operation. Individual terms vary but most franchisers offer:

- management and staff training,
- site selection advice and site finding if required,
- exclusive trading rights within a particular area,
- expertise in shop layout and design, staff recruitment and motivation, sales development,
- point-of-sale material and back-up advertising.

In most food service franchises, there are stipulations as to the operating hours of the outlet and as to standards of quality control and cleanliness. Franchises may be sold on an individual (one-off) or multiple basis, in the latter case with other organisations taking options on a number of outlets covering defined areas of operation.

3.04 Considerations

As a summary the advantages and disadvantages of franchising are:

<i>Advantages</i>	
<i>Franchiser</i>	<i>Franchisee</i>
Capital investment by franchisee	Help in securing finance
Rapid expansion of corporate image	Assistance in site selection
Widescale distribution	Company approved design.
Initial fee and/or royalty	Use of proven/established system
Sales of equipment and/or products	Purchasing specifications
Motivated and committed managers	Staff recruitment, training guidance
Local ownerships	Management information
Right to control standards	Use of brands, trade marks
Contribution to promotion	National promotion of products
Retention of company owned units	Reflected results of other units
Transferred responsibility for local rates taxes	Financial and operational control systems
charges	
<i>Disadvantages</i>	
Need for extended control	Little scope for initiative
Loss of own profits	Continual payment
Life cycle difficulties	Difficult to withdraw

Most franchisers operate company-owned units as part of the overall policy. These are often used as models for testing new products as well as for

merchandising and training. They are invariably located in the prime sites. Where this fits in with development policy the parent company may also buy back units previously franchised.

4. Business frameworks

4.01 Basis of operation

Every restaurant or club organisation must operate within a defined business framework. This is an essential requirement for commercial companies but the same broad guidelines apply to food service operations which are secondary or subordinate to some other function (contract catering, institutional and travel food services).

A company has to be established for a purpose which must be stated; business objectives or goals must be set out which enable management policies to be formulated. A business philosophy has to be laid down to establish standards of conduct and attitudes. Management must devise strategies for the future growth and development of the company's operations, with plans showing the targets to be achieved in the short, medium and long term.

The objectives and policy of a small family-run restaurant may be expressed in simple terms, more by verbal agreement and implication than definite statements. For large companies involving chain operations and multiple outlets – which may be company owned, managed or franchised – statements of policy, philosophy and goals are an essential part of the management structure. They form the basis for:

- coordinating activities throughout the whole organisation,
- identifying roles, tasks, relationships and incentives,
- standardising operations to ensure consistency and reliability,
- attracting investment and support,
- planning development and expansion.

4.02 Company purpose

This takes the form of a formal statement setting out the business domain in which the company is to operate. The borrowing powers of a company are set out in the Memorandum of Association. If exceeded, the loan is ultra vires and any securities given are void. Hence, the purposes of a company must be carefully defined to cover a broad range of future options. However, it is also necessary to provide more specific guidelines for both investors and management and the company must consider the parameters within which it expects to operate, for example:

- *product class*: types of restaurants, range of facilities to be operated,
- *product emphasis*: levels of service, quality

and price,

- *preferred locations*: city centre, high density routes, associated with other facilities, etc,
- *market orientation*: customer motivations, roles, spending powers.

4.03 Timing of new ventures

Restaurant and leisure operation is a dynamic process with new ideas and approaches being introduced continuously. Competition is keen and concepts which have proved to be successful are quickly imitated or extended. The life cycle of a design concept is generally very short – no more than five to seven years – and the range of alternative options is generally wide. However, the timing of new company ventures is also critical and must take account of two key factors:

Internal factors: company resources

- *product knowledge*: experience of business, associated interests,
- *resources available*: finance, expertise, supplies,
- *compatibility*: competition for resources, options, other benefits.

External factors: business environment

- *investment conditions*: economic climate, development and taxation benefits,
- *development openings*: available sites, franchises, potential acquisitions, links with property developers/real estate interests,
- *market opportunities*: market gaps, competition, growth potential (see section 6.08).

4.04 Business objectives and goals

Usually a company will pursue several objectives and these should be set out in order of priority or importance. Amongst the main objectives will be profitability, sales growth, improved market share, or risk diversion. Objectives must be consistent and where possible should be expressed in quantified terms. Examples of business objectives and the means by which they can be realised are summarised:

- *profitability*: return on capital to be achieved; time scale for profit goals,
- *sales growth*: by high volume turnover, competitive prices,
- *market development*: through continuous marketing, selective promotion,
- *product development*: through acquisition of premises in prime locations,
- *stability*: by providing customer satisfaction, value for money,
- *performance*: with efficient management, employee incentives.

4.05 Business philosophy

The philosophy of a company expresses the common doctrine of rules, beliefs and conventions which influence the way it conducts its business. Philosophies are, in part, concerned with ethical and operating standards (of honesty, reliability, courtesy, efficiency and hygiene) and, in part, with relationships (company attitude, customer importance, individual responsibility, staff participation and consultation).

Some requirements, like hygiene, can be set out precisely, while other aspects of philosophy are best demonstrated by example, training and company orientation seminars. In food service and leisure operations the correct relationship with customers leading to goodwill and repeat business is an important contribution towards success.

The distinction between philosophy and policy is a fine one. Both lay down sets of guidelines: the former in more general terms, the latter as more specific interpretations. Often both are incorporated in management policies.

5. Management policies

5.01 Formulation of policies

Management and operational guidelines on how the objectives of the business can best be achieved are set out in statements of policy. Essentially, these should cover three aspects: the *objectives* to be pursued, the *means* and the *constraints*.

Responsibility

Policies are usually formulated by the company directors, its senior management or, in the case of independent restaurants, the proprietor/managers.

Procedure

In small operations decisions are often based on intuitive or personal decisions and policies may only be expressed generally. Management policies in large organisations may have implications for the whole company and are usually formalised and centrally coordinated. Management techniques (corporate planning, decision theory, company modelling) may be applied.

Communication

Procedures must be drawn up to communicate requirements and to indicate functional responsibilities for putting these into effect (for unit management, franchised outlets, etc).

Formulation

Policies must be defined or reviewed:

- before commencing operation,
- when there is a significant change in conditions (market competition, financial circumstances),
- prior to refurbishment, expansion,
- periodically in light of trends and performance.

Non-commercial food services

Policy frameworks will generally specify the range of provision, standards of service and budgetary constraints.

Public sector

Broad principles may be laid down in national policies and applied through more detailed policy decisions at regional or local board levels of management.

Catering contracting

The commercial objectives of the contracting company (financial marketing and operating policies for development of the business) will apply as well as the particular requirements of each client.

5.02 General and sectional policies

To provide more specific guidelines the general policy is usually extended into sectional policies covering finance and marketing and, from these, catering and employment policies laying down the framework for operations. Further policies may be required for product development and franchising. The range of coverage and detail depends on the structure of the company and the extent to which management functions are devolved, but a systematic approach would be likely to include the following aspects.

<i>Policy</i>	<i>Examples of subject coverage</i>
<i>General policy</i>	<i>Company approach towards business; investment intentions; marketing aims; standards to be set, means of development; financial objectives, long-term goals</i>
<i>Sectional policies</i>	
<i>Finance</i>	<i>Approaches to raising finance: sources, capital structure and gearing, conditions for investment, use of share and loan capital, franchising (separately detailed) Development objectives: criteria for investment, capital budgeting, determination of priorities, allocations of finance</i>

	Financial framework: for setting and controlling levels of performance, profit targets, operating ratios
Marketing	<p><i>Market orientation:</i> characteristics of main market segments, patterns of demand, spending powers, expectations</p> <p>Interpretation of product concept: standards, value, locational and merchandising requirements</p>
Catering (or operation)	<p><i>Objectives:</i> for development and operation of facilities, financial and marketing frameworks</p> <p><i>Product formulation:</i> menu requirements, food quality standards, provision of alcoholic beverages</p> <p><i>Method of operation:</i> style of service, level of sophistication, operating periods and conditions</p> <p><i>Locational criteria:</i> preferred types of premises, space and capacity requirements, building ownership or rental</p> <p><i>Design emphasis:</i> corporate styling, degree of comfort, standards of furnishing, decor and equipment</p> <p><i>System of food production:</i> required types of equipment specifications, means of supply and installation</p> <p><i>Method of purchasing:</i> food, beverages and supplies, use of specifications, contracts</p>
Employment	<p><i>Organisational structure:</i> approach to determining the numbers of employees, duties and skills required</p> <p><i>Employer-employee relationships:</i> recruitment, selection and training, conditions of employment, remuneration and incentives, promotion and termination of employment, consultation, negotiation and settlement of disputes</p> <p><i>Means of management:</i> channels of communication, delegation of responsibilities</p>

5.03 Strategy

Strategy may be defined as a proposed course of action or sequence of actions intended to have a far-reaching effect on the company's ability to achieve its objectives. Strategies are normally formulated by senior management deciding how resources can best be employed in pursuing the objectives set by the company. To be realistic, they need to take into account:

- the company's current resources as well as

- its objectives and policies,
- its size and stage of development,
- the nature of the products, including life cycle considerations,
- the extent and characteristics of competition,
- the economic environment,
- employment conditions,
- trends in consumer behaviour and buying patterns.

5.04 Kinds of strategies

Strategies are generally grouped under four main headings: finance, marketing, production (or product development) and employment. To cover more specific aspects, such as investment needs, these may be sub-divided, although the divisions are arbitrary and will depend very much on the size of the company and its stage of development. A sole trader or partnership arrangement is unlikely to examine strategies in detail but will certainly need to have some guidelines for action to be taken, for instance, when seeking a loan or deciding how best to promote a restaurant.

Strategies and actionable plans become particularly important when a company intends to develop a chain of restaurants or to establish a new concept in food service or leisure-based operations with the view to franchising the product.

Examples of strategies

- Financial:* to improve financial performance or return on investment,
- Marketing:* to identify and develop new marketing opportunities,
- Product:* to develop a specific image and brand identity,
- Development:* to expand operations into new regional areas,
- Employment:* to rationalize job specifications and recruitment procedures.

5.05 Plans

As an expression of the strategies, plans express the objectives which should be attained in concrete actionable terms.

Plans may be:

- *short term:* a few months to a year ahead. Mainly concerned with the efficient use of existing resources,
- *medium term:* 1–3 years. Setting specific targets,
- *long term:* more than 3 years. Related to the life cycle of the product.

Plans are normally more numerate than policies; they postulate targets to be achieved within the given periods of time and should be related to the strategies being pursued.

<i>Examples of plans Measurable targets set for</i>	
Financial	Return on invested capital, profit ratios
Marketing	Volume of sales, club membership
Employment	Employee productivity ratios Individual management achievement (management by objectives)
Development	Number of new premises or outlets to be opened

The realisation of plans depends to some degree on the accuracy of forecasting, particularly over the long term. Forecasting techniques which rely on the analysis of past data give some indication of medium-term trends but the market life of a restaurant or leisure concept invariably follows distinct phases (see Chapter 1, section 5.03).

5.06 Budgetary control

Objectives strategies and plans are subsequently translated into budgets which enable budgetary controls to be introduced as a means of constantly comparing actual and budgeted performance:

- *capital budgets*, concerned with restaurant assets and liabilities are incorporated into a budgeted balance sheet,
- *operating budgets*, are consolidated into a budgeted profit and loss account. Similar measures may be used to assess other performances (stock control, planned maintenance, development programmes, project management).

5.07 Forecasting

In order to draw up long-term plans, anticipate requirements and determine strategies for future growth and development, it is necessary to predict what the future situation is likely to be. In identifying future designs and modes of operation for food and leisure services this is problematic: previous experience is not likely to be repeated because circumstances, needs and fashions change. However, demographic trends, the impact of economic changes and shifts in social attitudes can be evaluated and, to a large

extent the influences of such changes on food service and leisure based operations can be foreseen.

5.08 Quantitative analysis

To obtain a quantitative analysis as well as a qualitative or subjective assessment, forecasting techniques require comparative statistics which are broad enough to separate trends from cyclical and arbitrary variations. Empirical data from individual surveys can be very misleading but may be used to supplement more broadly based statistics in, for example, examining particular opportunities or trends in employment costs.

5.09 Forecasting techniques

There are two particular forecasting techniques:

- by extrapolation from the present situation,
- normative methods working back from a future hypothesis.

Extrapolation is used to examine the course of developments liable to affect the future of the company, for example in

- planning future growth based on economic trends,
- predicting operational needs to meet changing demographic and social patterns.

Extrapolation may involve techniques such as morphological research, scenario writing, Delphi methods, trend extrapolation and correlation and simulation modelling.

Normative methods are useful in evaluating futuristic ideas (on design, production or service) or new concepts (such as vending, automation, flexible working) and the future changes in conditions which would make these relevant to company development. Techniques include review or feedback schemes and systems analysis.

6. Investment criteria

6.01 Comparisons: commercial and non-commercial projects

Whilst there are many similarities in commercial and non-commercial food services – such as the

	<i>Commercial operations</i>	<i>Non-commercial food services</i>
Market demand	Critical for profitability Open to competition – highly unstable	Known in advance Expansion may be limited Relatively stable
Prime considerations	Careful location, market positioning, promotion, competitive pricing	Social and nutritional benefits; economy or value provided; price and subsidy constraints
Investment	High fixed costs in building and equipment	Lower costs – which may be partly or fully discounted
Key policy	Means of increasing revenue and volume of sales (market orientated)	Means of controlling variable costs within set prices or subsidy limits (cost orientated)

need to respond to changes in requirements and to control costs – there are significant differences which affect the feasibility of investment.

6.02 Analysis of investment

Some form of investment analysis is always necessary in order to justify the amount of capital to be committed and to assess the level of return which can be expected. The type of analysis required depends on the nature of the project and objectives of investment. The latter may take account of secondary benefits, for example in increasing the room occupancy of a hotel or the traffic flows in a store.

taxes and insurance which are fixed regardless of the amount of revenue earned,
 — *interest, depreciation and other deductions* which depend on the initial level of investment and may be uniform fixed amounts (straight line method) or change over time.

6.04 Break-even charts and other techniques

The relationship between sales revenue, fixed costs and variable costs may be broadly illustrated by break-even charts.

However, this relationship is usually more complicated and for any particular restaurant there is often an optimum level of business which

table 6.02		
Analysis	Objectives	Applications
Feasibility appraisal	To test the commercial viability and rates of return against investment strategies	Commercial restaurants
Commercial benefits	Including indirect revenue from association, improved grading, increased customer flow	Hotels, food courts, store restaurants
Cost benefit analysis	Broader evaluation of the economic justification for investment including job creation	Tourism development and grant aided projects
Capital budgeting	To determine capital allocations taking account of needs, priorities, operational savings	Non-commercial sector, institutional facilities

6.03 Approach to feasibility analysis

In order to determine the extent of profit or subsidy required it is necessary to estimate both the income and costs likely to be involved.

Sales revenue.

Revenue depends on the average spend per head (average bill or check) and the volume of customers. Both are inter-related and dependent on the size of market and premises:

- *for fast-food operations* the pricing strategy may be targeted to achieve high volume sales (both in seat turnover and counter sales) in a large but price-sensitive market,
- *in a full-service restaurant* there is a finite limit to seating capacity and differential pricing and promotion may be used to increase the number of covers (at slack periods) or the average spend where appropriate.

Costs.

The costs of restaurant operation fall broadly into four groups:

- *cost of sales* covering food commodities and beverages purchased which vary directly with the volume of sales,
- *controllable costs* including payroll and operating expenses which are also mainly variable but may include a fixed element of cost,
- *occupation costs* such as rent, property

will provide the highest profitability. Computer simulation is usually necessary to test the effects of changes in both sales and costs on the levels of profits to be expected.

As a very broad guide, depending on the scale of investment, the annual turnover/investment cost is usually about 2–3 for full-service restaurants and 1–2 for high volume fast-food units.

6.05 Property development

Restaurants may be provided in many kinds of premises, for example:

Type	Situations
Purpose-built stand alone units	Along highways (near filling stations, junctions, car-parks); in recreational areas, including drive-in restaurants and American diners
Street frontage properties	In shopping, commercial, tourist and entertainment areas in cities and towns
Arranged as food courts within other establishments	Within shopping malls, shopping centres, departmental stores, main railway stations or self-contained; in hotels, theatres, stores, airports and other premises

Examples of premises are given in Chapter 10.

Depending on the situation and type of premises involved there may or may not be the option

Take Four Food Court, Arndale Centre, Manchester

The Arndale Centre is the largest indoor shopping complex in Europe. Although comparatively new, it is undergoing a programme of upgrading to create a new trading image with greater orientation towards leisure and imaginative design.

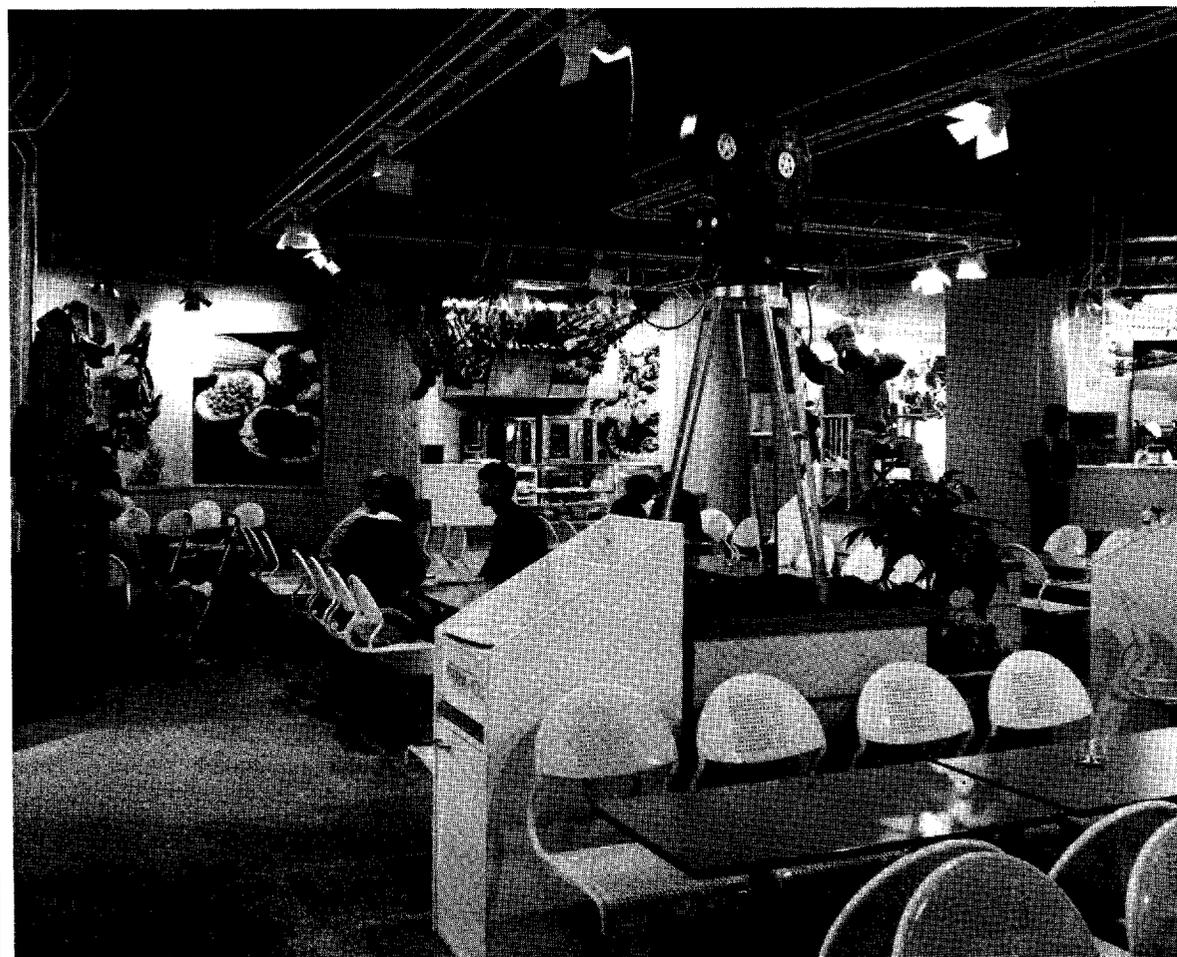
Take Four derives from the film themes used for four kiosks in the food court: a croissanterie, baked potato outlet, sandwich deli and an ice-cream parlour. Seating is also combined in different groupings.

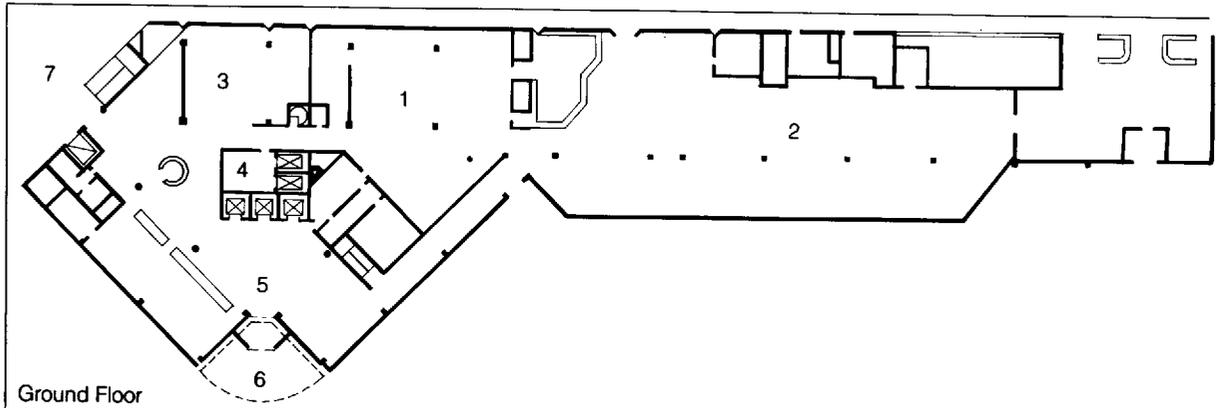
Weekly throughput at Take Four is around 9,000 people with the croissanterie proving the most popular outlet.

Architects and designers: Building Design Partnership

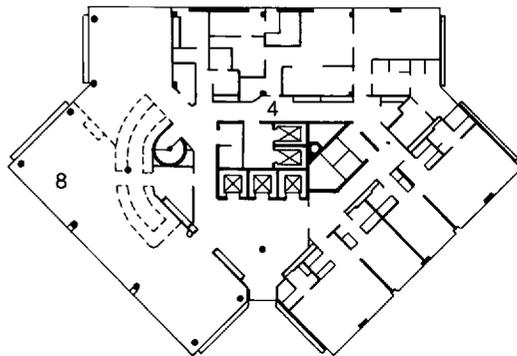
Clients: Arndale Shopping Centres Ltd

Project cost: £380,000

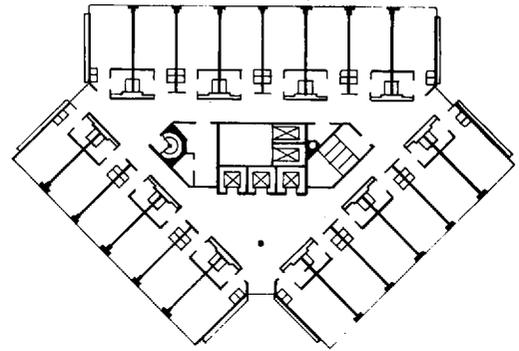




Ground Floor



18th Floor



Typical Floor

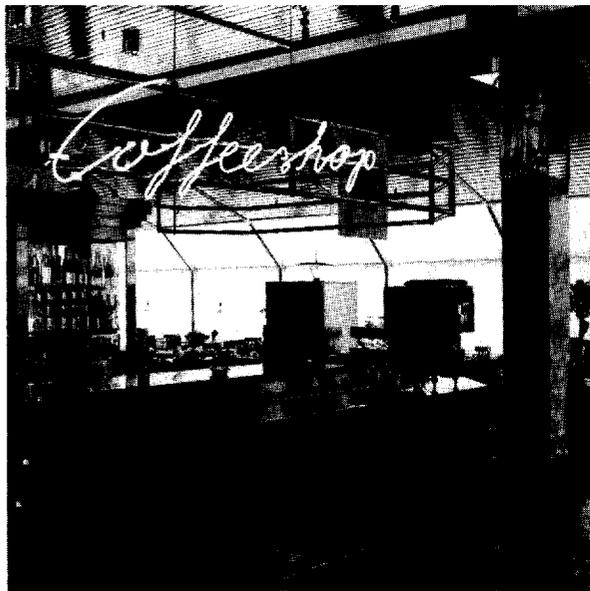
- 1 Kitchen
- 2 Gallery coffee shop
- 3 Grandeur restaurant
- 4 Service
- 5 Lobby
- 6 Hotel entrance
- 7 Exhibition lobby
- 8 Gemini sky bar

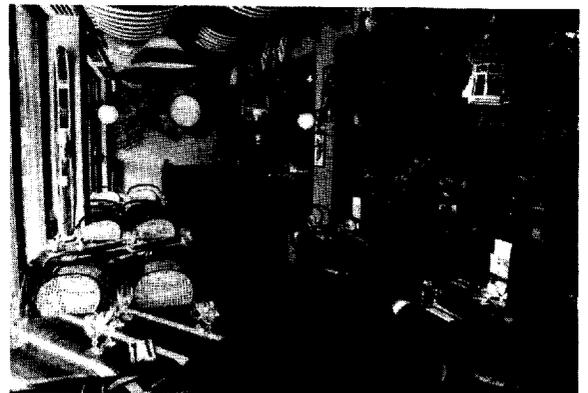
SARA Hotel, Gothia, Gothenburg, Sweden

One of the new hotels in the expanding SARA Group, the Gothia cost US \$14 million to build, of which some US \$1 million was spent on the furniture and fittings of the restaurants and bar including kitchen and back of house equipment. These include the Grandeur Gourmet Restaurant, Gallery Coffee Shop and Gemini Sky Bar. The theme is modern and stylish throughout, with many individually designed features.

Architects: Olle Anderson, White Arkitekter Ltd
 Clients: SARA Hotels







Key

Furniture variations

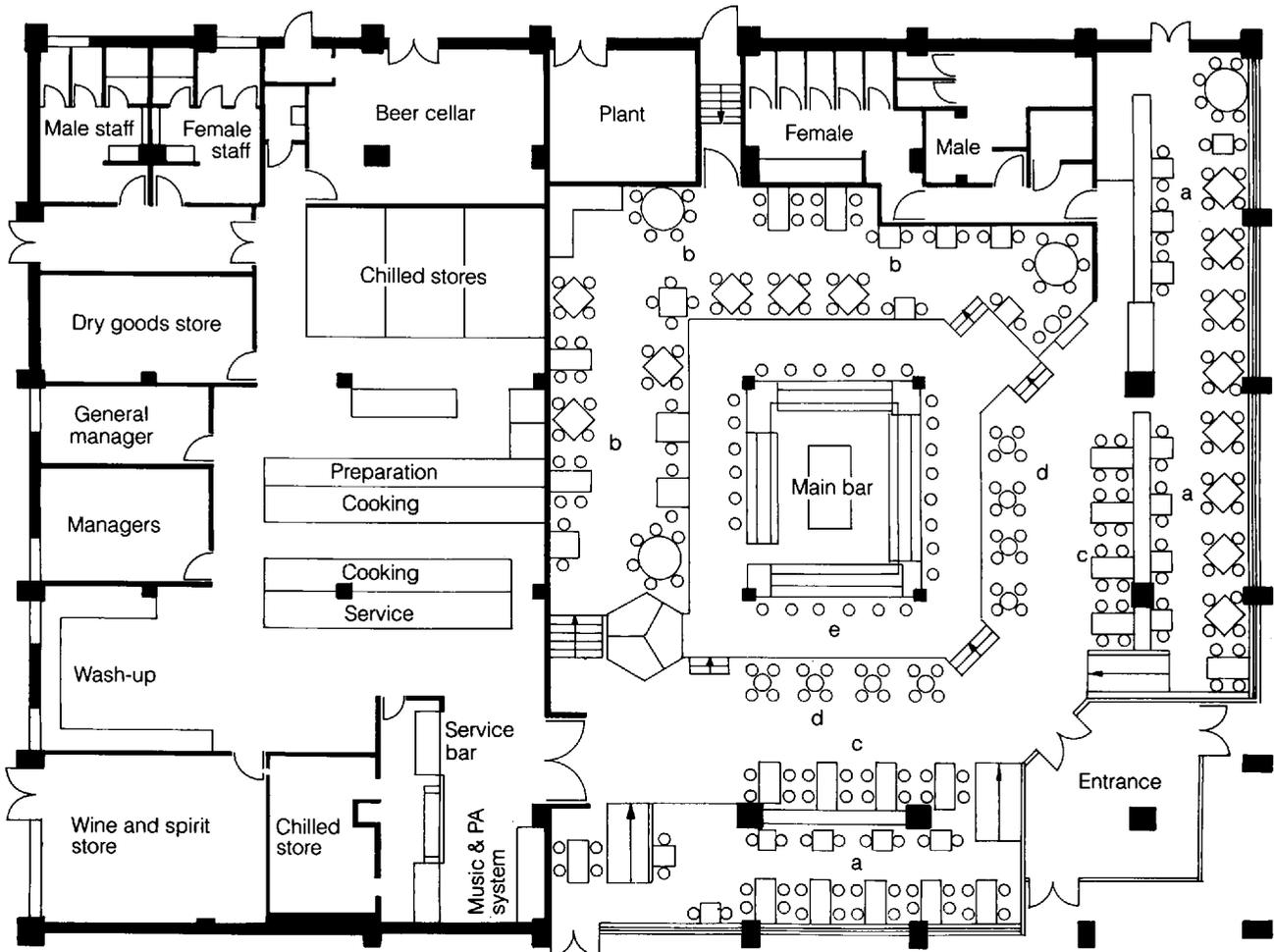
- a walnut armchairs
- b bentwood chairs
- c walnut chairs
- d cruise tables with bar stools
- e bar counter stools

Calendars, Watford

Calendars was created as a prototype for a nationwide chain involving extensive research and development over 2½ years at a cost of £1 million. Designed and purpose-built as an American-style café, bar and restaurant rolled into one, Calendars appeals to families, businessmen and single women as well as the more affluent twenties age group. Every nook and cranny is stuffed with bric-à-brac, all genuine American kitsch, providing interest and entertainment. By varying the levels of the oak floor and controlling lighting intensities, four distinct moods are created, from the elevated central bar for young singles and couples to family tables around the perimeter.

A more intimate area is also provided. Overall lighting is dim but with numerous shapes, sizes and colours of luminaires adding to visual interest. High quality music is balanced to suit all age groups. Retail space occupies 60 per cent of the 102 m² (1,100ft²) site. The kitchen is carefully designed to back up a menu of 80 different dishes with fast, efficient service from separate cooking stations – fry, saute, sandwich and grill. Three strategically placed bussing stations are provided to allow efficient clearing of tables.

Designers: Murdock Design Associates
 Clients: Vittle Inns, a subsidiary of Allied Breweries



to buy the freehold or to lease a property and other restrictions on use may apply. In Great Britain restrictions on development or use can be imposed by:

Legislation	Possible effects
Town and Country Planning	Conditions for change of use, access, extensions or new buildings
Listed buildings of historical or architectural interest, conservation areas	Restrictions on alterations, changes to external façades, extensions
Common law easements and licences	Rights enjoyed by other owners affecting the property (way-leaves, natural light, support, drainage, etc)
Highway limitations	Building line encroachment and other restrictions
Public Health, Food Hygiene, Health and Safety at Work and other legislation	Facility requirements and provisions for future use as a restaurant

6.06 Leasehold and freehold options

Commercial considerations in deciding whether to buy or lease property are extremely complex and depend on external factors such as taxation allowances as well as company policy and financing arrangements.

Some of the broad issues which apply in Great Britain may be summarised:

Ownership

- the asset value appears in the balance sheet, provides greater borrowing strength allowing 'gearing up' for expansion, etc,
- a business will usually need to provide about twice as much profit to buy the business and freehold at the same time,
- current government policy phased out Initial and First Year Capital Allowances on commercial investments in 1986 although writing down allowances may still apply on plant,
- capital gains from the sale of premises may be rolled over if spent on other property but otherwise could impose a tax penalty,
- the freehold may subsequently be sold to a financial institution, bank or insurance company, etc, and leased back under suitable conditions,
- freehold purchasing may be necessary to ensure future availability of prime sites (for fast-food chain development, etc).

Leasehold

- leasing provides cash flow benefits with generally lower costs,
- taxation advantages can be applied. As a

rule a lease does not count as an asset unless it is long term at lower than marketable rent,
 — leasehold rents are usually established by the free market value of the property. In street frontage sites this favours high-volume sales (fast-food units) rather than traditional restaurants,
 — the terms of lease are critical, for example:

Terms	Considerations
Type of lease	A 'headlease' may be required rather than sub-leasing
Unexpired period	Affects length of lease, loans, saleable value
Rent reviews	Frequency of negotiation, method of assessment
Liability for repairs	A 'full-repairing' lease imposes costs on the tenant
Improvements	Tenant's benefits, means of valuation
Repurchasing rights	Owner's right to repurchase, valuation of goodwill
Restrictions on use	May limit business expansion or development

Both rents and rates (property taxes) may be subject to appeal if the value of property can be shown to have become blighted or reduced by external conditions.

6.07 Method of financing

Financing arrangements depend very much on company policy and the strategy being pursued at the time (expansion, consolidation, selective development, etc). Capital resources may, for example, be provided by:

- *internal company finance*: re-investment of profits, share issues and flotations, sale of other assets,
- *external loans*: from financing institutions, commercial banks, merchant banks,
- *franchising*: sale of licences or franchises to investors,
- *combined methods*: joint investment using part loan finance or property assets.

Many large companies (breweries, supermarkets, garage services, etc) have jointly developed their properties with more specialised catering companies either through franchising or forming subsidiaries.

6.08 Conditions affecting capital expenditure

Capital investment, whether in new or refurbished premises, is highly dependent on many factors. For restaurants the investment risks are often heightened by:

- the difficulties of securing suitable sites and the high rents and conversion costs which may be

involved, and

— price competition between establishments in trying to increase their shares of the market.

Thus the margins of profitability can be finely balanced and a detailed feasibility study of each project is essential.

The timing and level of investment will also depend on the financing conditions:

External conditions.

Investment decisions are greatly affected by general economic conditions such as the cyclical pattern of share prices, development costs, interest charges and opportunity costs of capital, rates of inflation and prospects for economic growth.

Capital projects necessary for tourist development or to create employment in development areas may attract grants or loans from the agencies concerned. The conditions governing capital allowances for taxation (depreciation of plant, leasing) and the rates of Corporation Tax on profits are particularly important (see sections 6.06, 6.11).

Internal conditions.

Internal factors such as the strategy of the company towards expansion or diversion of development are also critical. This also depends on the financial resources of the company, its cash flows and borrowing strength (gearing ratio) and competing demands (see section 5.03).

6.09 Level of investment

Capital requirements are determined mainly by the size, location and type of premises involved. The space may be critical to ensure an adequate

seating capacity to provide the turnover which is needed to finance the investment. Most franchisers specify space and capital requirements for their units. The following examples indicate the range of costs (in round figures) involved in Great Britain, for complete restructuring and refurbishment of the building shell – including new equipment – although individual projects will show wide variations.

6.10 Operating ratios

Statements of income and expenses are used to evaluate and compare the operating performance of different premises. The figures may be expressed as amounts per seat or as ratios compared to the total sales.

The following analysis shows the operating ratios which were representative of a wide range of restaurants in 1984 and the variation in different types of establishment. These figures are based on the surveys carried out by Laventhol and Horwath¹ for the National Restaurants Association in the United States and a number of British studies. (See table, p. 41.)

6.11 Feasibility analysis

As indicated in section 6.07, the methods used to finance restaurant projects vary widely depending on how the capital is to be raised and the extent to which emphasis is placed on increasing cash flow profits or providing for depreciation and other costs. The latter will be affected by the development strategy of the company and particular taxation advantages.

Typical methods of feasibility analysis are illustrated by three hypothetical examples set out in p. 42. These are based on median figures but actual projects may show wide differences.

Type	Seating	Area		Capital costs 1986 £	Cost/seat 1986	
		m ²	ft ²		£	\$(a)
Small counter type	30	93	1,000	50,000–100,000	1,600 3,300	2,600 5,300
Franchised unit						
Hamburger type fast-food units	100	280	3,000	300,000–500,000	3,000 5,000	4,800 8,000
Full-service themed restaurant	80	240	2,600	200,000–320,000	2,500 4,000	4,000 6,400
Refurbishment hotel restaurant(b)	80	280	2,000	120,000–240,000	1,500 3,000	2,400 4,800
Conversion 'pub' counter meals(c)	50	93	1,000	40,000	800	1,300

(a) US\$ used to show comparable rates (based on \$1.60=£1.00).

(b) Refurbishment costs include all new equipment and fittings.

(c) 'Pub' conversions only cover the 'food' section of the bar.

Average unit costs (1986) including equipment and furnishings:

— small-scale projects and conversions £500–£600/m² (\$75–\$90/ft²)

— themed restaurants and major alterations £1,000–£1,200/m² (\$150–\$180/ft²)

— specialised fast-food systems £1,200–£1,500/m² (\$180–\$225/ft²)

For partial refurbishment, replacement of equipment and other life cycle improvements proportionately lower costs are involved.

<i>Ratios to total sales</i>	<i>Median</i>	<i>Variations and explanations</i>
<i>Sales</i>	<i>%</i>	
Food	72	Food sales normally 69–75% but reduce to 65% in wine bars and 54% for pub counter meals
Beverages	27	
Total sales	100	
Cost of sales		
Food	38	High-cost food (steak, seafood) 40%, low-cost (pizza, etc) 30%
Beverages	26	
	35	– comprising 28% food costs, 7% beverage costs
Gross profit	65	– sometimes used as the mark-up for pricing
Other income	1	
Controllable expenses		
Payroll	26	Fast-food units 20%, full-service restaurants 35–36%
Employee benefits	3	Prime costs of food, beverages and labour together add up to 65–68%
Direct operating expenses	6	Laundry, linen, uniforms (1.5%) replacements (0.7%) supplies (2%) menu printing and contract services (1.7%).
Music and entertainment	0	– normally small. Full-service restaurants (1–2%)
Advertising and promotion	2	– including contribution to group advertising
Utilities	3	– normally 3–4%
Administrative and general	4	– range 3–5%
Repairs and maintenance	2	
Total controllable costs	46	Fast-food units (40%), full-service restaurants (48%)
Occupation costs		– income before occupation costs 14–22%
Rent	5	– normally 4–6% but higher in prime locations
Rates, property taxes		– rates and taxes (1.4%), insurance (0.8%)
Other taxes	2	
Property insurance		
Interest	2	Depends on extent of loan finance: normally 1–5%
Depreciation	3	Affected by life cycle and company policy: 2–6%
Other deductions	1	Fees and royalties, miscellaneous charges
Net income before Income Tax	7	Median range 4–8% but high-volume sales can yield up to 15% or more

1. NRA News, 'National Restaurant Operations', Reports 1982, 1983 and 1984, Laventhol and Horwath, 1985

Type of premises	Hamburger-type fast-food unit	Full-service themed restaurant	Hotel restaurant (refurbishment)
Area(a)	280m ²	240m ²	280m ²
Seating capacity	100	80	80
Investment cost(b)	£400,000	£200,000	£160,000
Cost/seat	£4,000	£2,500	£2,000
Method of financing(c)	50% own capital 50% by loan at 15% fixed interest		100% own capital
Loan period (life cycle)(d)	10 years	10 years	10 years
Average spending(e)			
food	£2.30	£6.20	£7.90
beverages	£1.00	£2.30	£2.60
Seat turnover/week	2,500	780	720
Take-away sales	800 (33%)		
Sales/year	£566,000	£345,000	£393,000
Sales/seat/year	£5,660	£4,310	£4,910
Cost of sales (per seat)	£1,981 (35%)	£1,638 (38%)	£1,768 (36%)
Labour costs	£1,302 (23%)	£1,207 (28%)	£1,669 (34%)
Overheads(f)	£1,189 (21%)	£862 (20%)	£982 (20%)
Interest on loan	£300 (5.3%)	£188 (4.3%)	
Depreciation and capital repayments(g)	£400 (7.1%)	£250 (5.8%)	£200 (4.1%)
Income before } (per seat)(h)	£488 (8.6%)	£165 (3.8%)	£291 (5.9%)
Corporation tax } (total)	£48,700	£13,200	£23,280
Return on own capital employed	24.5%	13.2%	14.6%
Employee productivity index, sales/payroll	4.35	3.57	2.94

(a) Area: space and seating capacity may be critical unless a high proportion of sales are for food consumed off the premises.

(b) Costs: should include interest on loans prior to opening, pre-opening expenses (staff recruitment, initial supplies, advertising) and working capital.

(c) Method of financing: for small-scale projects this could include hire purchase of equipment. Interest may be based on a declining balance.

(d) Loan period: should be related to the life cycle of the concept (normally 5-7 years).

(e) Average spending: depends on pricing policy and extent of competition for the market targeted.

(f) Overheads: include controllable and occupation costs of premises.

(g) Depreciation: writing down allowances (currently 25%) are allowed against tax for plant which includes most equipment and special fixtures.

(h) Income: Corporation Taxes in Great Britain have been progressively reduced from 45% (1984-5) to 40% (1985-6) and 35% (1986-7).

Cash flows may be required to finance other improvements and investments.

6.12 Prices

Prices determine the market segment likely to be attracted as well as the income generated. In addition to monetary changes, other customer sacrifices or benefits should be considered in setting prices, for example, convenience, opportunity and uniqueness.

Pricing strategies are determined by company policies and the targets set in corporate plans. The primary objectives may be:

- *profit maximisation*: maximum cash flow, high return on investment,
- *sales development*: increased market share, maximum sales volume,
- *competitive pricing*: to match competition, maintain price differentials,
- *cost reduction*: recovery of costs, break-even pricing (non-commercial sector).

Certain factors affect pricing:

Price factors	Characteristics
Products	Highly perishable (space, services, food)
Demand	Highly peaked (meal times). Usually cyclical
Capacity	Limited by seating and achievable occupancies
Competition	Intensive between non-differentiated products
Price sensitivity	Increases with lower average spend per person
Up-market	Demand influenced by food quality, service, atmosphere

6.13 Costs

Costs of operating food service businesses are only partly related to sales. The main elements of costs are:

- *fixed costs*: (rent, property taxes, depreciation, loan charges, insurance, overheads) do not vary with volume of sales. An accurate assessment of fixed costs must be made in the feasibility analysis. Uncontrollable fixed costs typically amount to about 13±5 per cent of sales revenue,

- *semi-fixed costs*: (energy, labour, repairs and replacements) vary marginally with the volume of sales but only partly within control. Labour costs usually account for about 28±5 per cent.

- *variable costs*: (food, beverages, casual labour, laundry) vary in proportion to sales. Depending on pricing policy, food costs range from 35 to ± 5 per cent of selling price and beverage costs 25 ± 5 per cent.

6.14 Methods of pricing

Two main methods of pricing are used:

Cost percentage

Based on direct costs of food and beverage plus a calculated percentage of gross profit to cover other costs and the required margin of profit. Food costs may be based on the prime ingredient or standard recipes.

Price differential

Differential profit margins may be used to allow for:

- price elasticities of demand,
- fluctuations in levels of demand,
- extent of competition.

Sales analysis, allocation of costs and marginal costing are facilitated by the use of management information systems (see Chapter 7, section 7.01).

6.15 Break-even analysis

Break-even charts can be used to show the relationships between costs, sales and margins of profit. They can also show the sensitivity to changes in costs of prices (see chart, p. 44).

6.16 Construction cost analysis

An indication of the breakdown of costs for new commercial restaurants and conversion schemes is given. Actual cases may show wide variations:

Examples of pricing strategies:				
<i>Hotel restaurants</i>	<i>Coffee shop</i>	<i>A la carte</i>	<i>Carvery</i>	<i>Banquets</i>
Food and beverage costs (%)	35	40	45	30
Gross profit percentage (%)	65	60	55	70
<i>Analysis of sales mix</i>	<i>Starters</i>	<i>Main courses</i>	<i>Vegetables</i>	<i>Sweets</i>
Food costs (%)	30	45	25	25
Gross profit* (%)	70	55	75	75

*weighted to give overall 65 per cent.

table 6.16

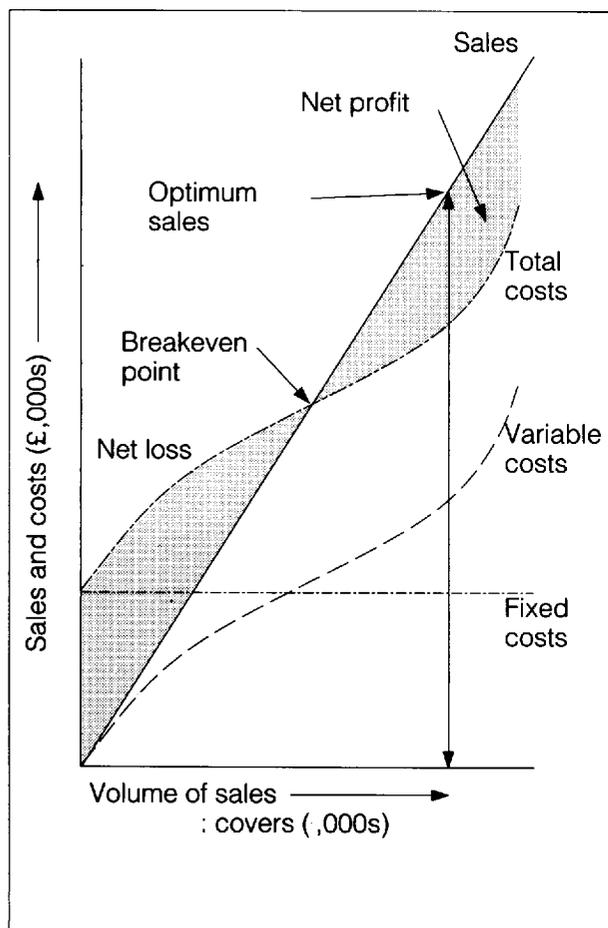
Type of work	New premises (major conversions)		Notes
	£/m ²	%	
Preliminaries, insurance, miscellaneous	78	8	Variable: depends on location
Structural/building work			
Shopfitting, metalwork glazing	235	24.5	New or refitted premises
Shopfront signage	26	2.7	Corporate styling
Finishes and decor	91	9.5	
Furniture, seating, tables, furnishings	133	13.9	Increased for leisure dining
Plumbing and drainage, gas installation			
Mechanical ventilation	115	12	Food production areas and toilets
Electrical installation, lighting	90	9.4	Including lighting fittings
Kitchen intallation			
Kitchen equipment, accounting equipment, etc	192	20	Increased for high output (fast food, self-service)
Construction and furnishing total	960	100	
Franchise fees	58	6	Franchised units only
Fees, licences, stamp duty	144	15	
Start-up costs, pre-trading wages	38	4	Training, advertising, stocking
TOTAL COSTS	1,200	125.10	

Costs are based on 1986 prices.

Range of costs for most major conversions $\pm 25\%$

Minor alterations or refurbishments: allow proportionate costs.

For US comparisons: \$1.58=£1.00



3

Marketing and Merchandising

1. Market characteristics

1.01 Market orientation

The successful development of any consumer product – whether concerned with food services, leisure interests or other goods and services – is dependent on the market demand for that particular product. Markets can be segmented according to the factors which are likely to affect customer choice and spending power (socio-economic groupings, cultural tastes, etc). The potential sizes of market segments can also be estimated from two main levels of demand.¹

<i>Primary level</i>	
Basic demand	Existing demand which is un-served or frustrated by lack of suitable opportunities in the locality
Displaced demand	From clientele of other establishments whose needs are not being fully met
<i>Secondary level</i>	
Created demand	Derived from new customers who do not normally use such facilities. Induced by merchandising and promotion
Future demand	Likely to arise from increases in population, socio-economic growth, changes in style of living, development of tourism, etc

Although a new food service or leisure project may in the long-term benefit from all these, the extent of the basic demand which can be realised when the premises opens is important in determining feasibility. Created and displaced demands usually require time and sustained promotion to exploit their potential. Future demands provide the basis for planning the longer term development of chain operations and franchising opportunities.

1.02 Market differentiation

Investigations of the market potential for a new or modified product involve three main categories of analysis:

— *quantitative*: size, population and socio-economic structure of the catchment area. Extent of competition. Market segmentation, potential numbers of customers. Expected patterns of use, peak demands, seat turnover rates.

— *qualitative*: target customer groups, socio-economic profiles, cultural tastes, spending levels, expectations. Standards of quality and skill required. Market positioning, evaluation of competition.

— *behavioural*: situational and circumstantial influences on buying decisions. Consumer motivation. Psychogenic (psychological and emotional) factors. Approach to merchandising.

All of these are to a large degree interdependent. The techniques of marketing are set out in Chapter 3, sections 2 and 3. Consumer behaviour is examined in Chapter 3, sections 4 and 5.

1.03 Product characteristics

Unlike consumer products which may be of lasting benefit, products such as meals, drinks, entertainment and leisure activities are judged largely on face value. In broad terms product design is concerned with:

- meeting physiological needs for food, drink, refreshment, restoration and change,
- providing an appropriate setting and ambience for the desired social atmosphere and other behavioural responses (see section 6).

1.04 Stage of development

The type of marketing and product research required for any project will depend on the objectives of the company, its resources, corporate strategy and development plans.

<i>Policy framework</i>	<i>Research</i>
With a defined product and market orientation (supply led)	Selecting suitable sites and examining market opportunities for development in particular locations
Without a specific product responsive to market needs (demand led)	Identifying market gaps and the types of products which could satisfy them generally or in particular locations

1.05 Market research

Depending on the stage of development, five main streams of research may be involved.

Consumer research

Consumer behaviour, attitudes and motivations
Cultural, ethnic and socio-economic structures, influences on consumer choice
Determinants of demand, economic and demographic trends
Consumer pressure groups.

Resources research (see Chapter 1, sections 4.02–4.03)

Company objectives, corporate strategy, plans
Financial resources, expertise, related interests



Harry's Café, York

This new café-bar concept was planned for a location with large pedestrian flow during the day and good car parking at night. It is open from 10 a.m. to 11 p.m. and serves alcoholic beverages during permitted hours.

The bar has a shopfront for good visibility in and out and the design theme leans towards American

Victoriana with a large, ornate bar which also includes food and drink sections. Coloured glass lights are featured and the lighting changes from a daytime café atmosphere to entertainment for younger persons in the evening.

Concept development: Joshua Tetley & Son, a division of Allied Breweries

Economic and commercial climate, opportunity costs of capital, trends
Development opportunities, site availability, links with property.

Product research

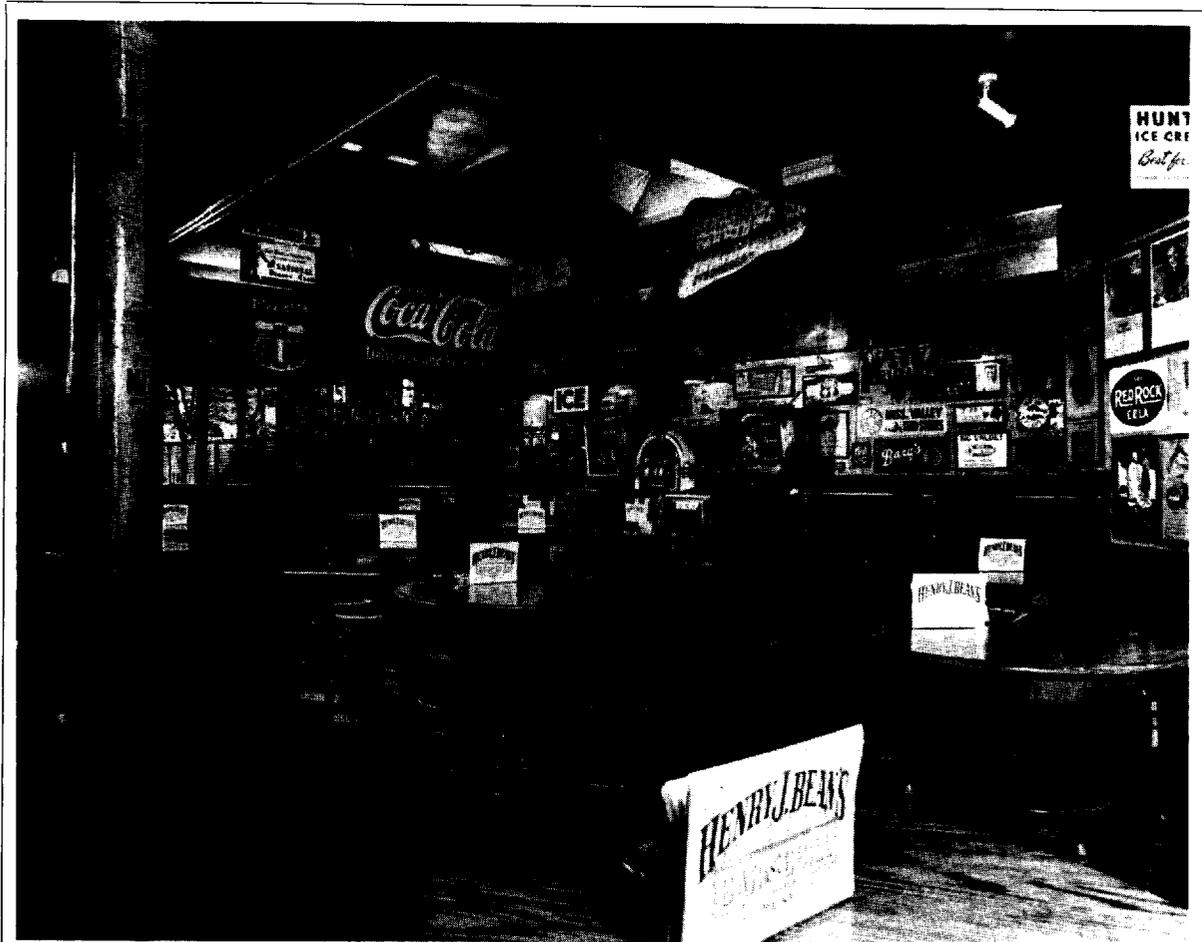
Product concept, unique characteristics, marketable features
Operational requirements, systems of production, style of service
Standards, levels of sophistication and price
Commercial feasibility, operating ratios, profit margins
Optimal locations and conditions for development
Legal requirements, codes and standards for operation and consumer protection.

Market research

Market catchment area, structural and demographic characteristics
Economic activities, employment, socio-economic statistics
Commercial locations, trends in development and property values
Visitor attractions: entertainment, tourism, leisure interests
Traffic flows, access and parking restrictions.

Competition research

Existing facilities: locations, market segments, extent of business
Competing products: strengths, weaknesses
Proposed new facilities or closures, other related developments
Market gaps and opportunities for new products.



Henry J. Bean's, London

This bar-grill operation is designed to create a lively, jazzy, crowded atmosphere. The decor is represented by a haphazard arrangement of American posters, graffiti, street signs, car number plates and notices. In

this particular site a feature has been made of the garden.

Architects: Broadbent Williams Ltd
Clients: My Kinda Town

1.06 Objectives

Marketing research is necessary in order to:

- develop new concepts in restaurant and leisure based operations,
- expand existing products into new areas, or
- introduce more profitable uses for operations which are nearing the end of their commercial lives.

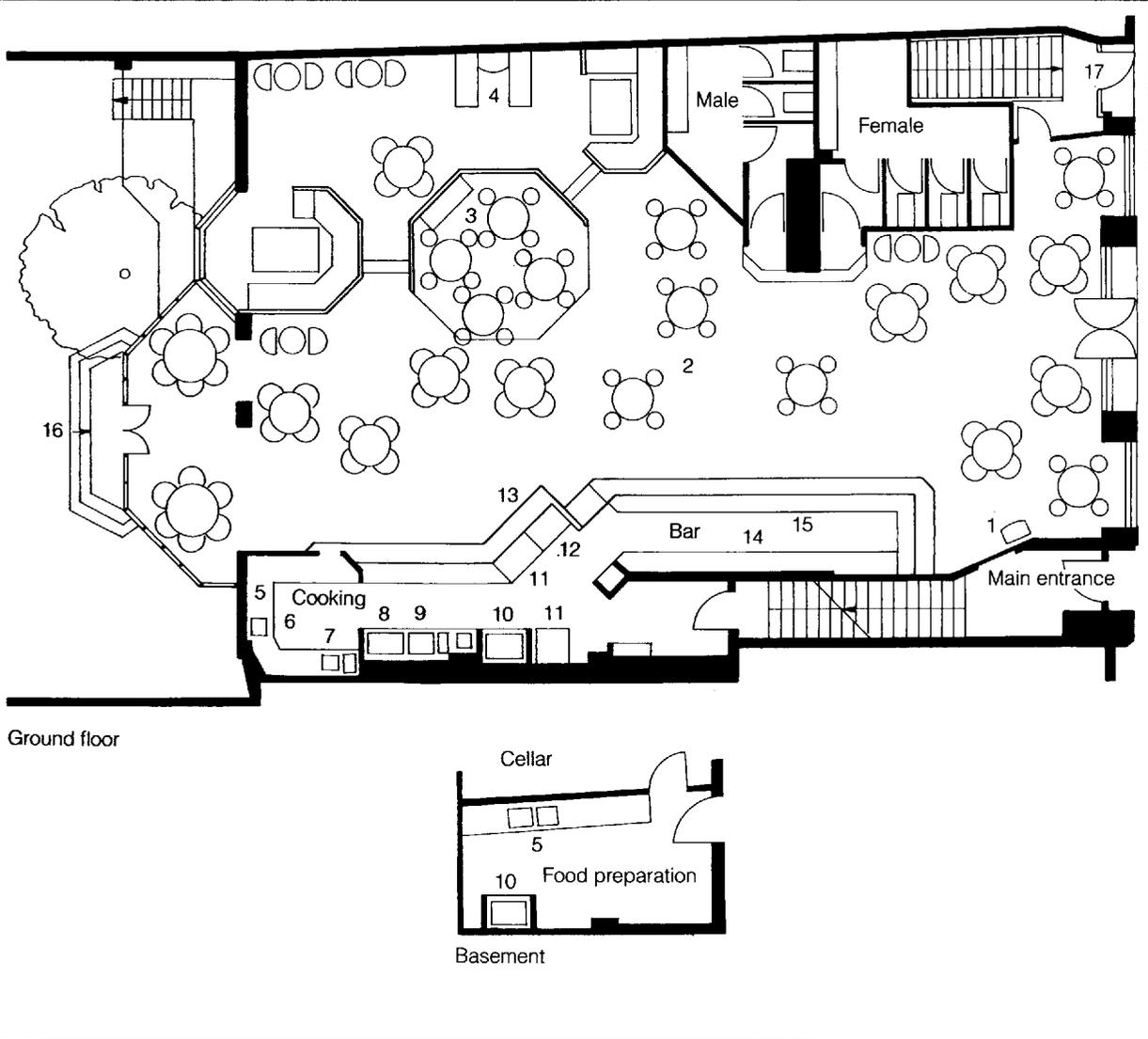
In these cases marketing information is seen as an input for feasibility studies and economic appraisal of the investment required.

Monitoring of established markets is also necessary through ad hoc or regular surveys of existing customers to assess:

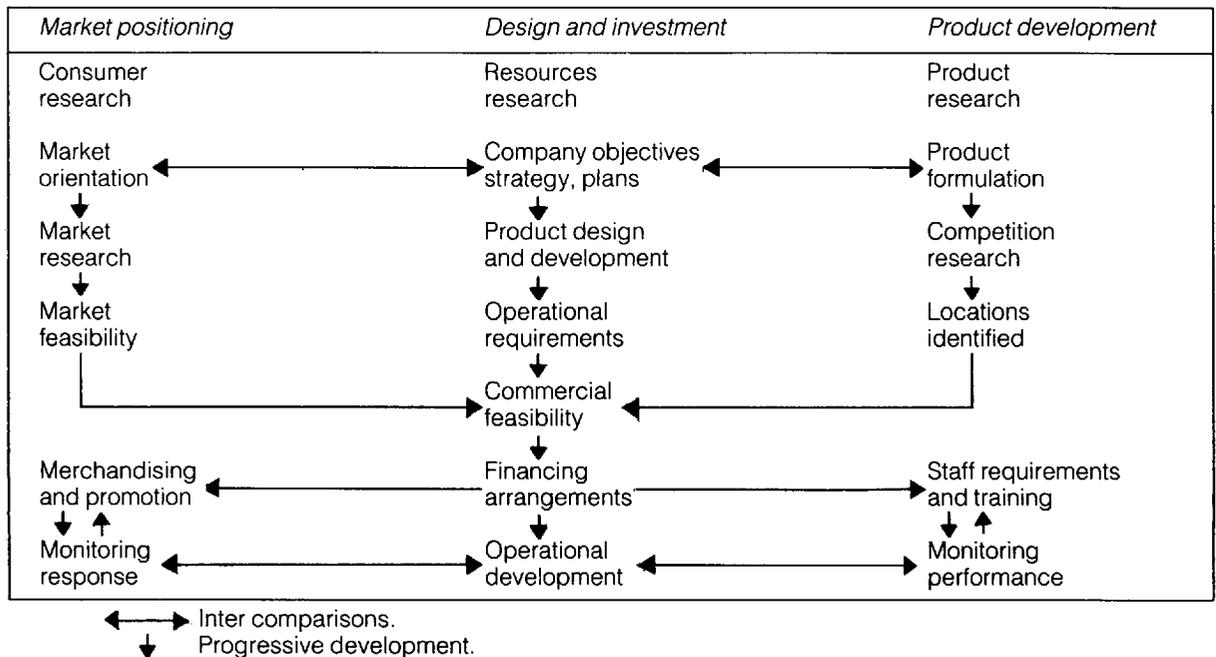
- changes in response,
- the effectiveness of different forms of promotion, and
- results of minor changes in the operation itself.

Monitoring may, for example, test the introduction of new items on the menu or changes in style of service.

- Restaurant**
- 1 Video
 - 2 High level tables with swivel stools
 - 3 Piano
 - 4 Great juke box and pinball tables
- Servery**
- 5 Preparation bench
 - 6 Wash-hand basin
 - 7 Microwave oven
 - 8 Griddle
 - 9 Fryer
 - 10 Hoist
 - 11 Fridge
 - 12 Ice cream
 - 13 Condiments and cutlery
- Bar**
- 14 Mirror-backed display shelving
 - 15 Marble bar top
 - 16 Garden with bench seats and flaming fountain. All trees retained
 - 17 Entrance to Kidds Bar



1.08 Inter-relationships





Fox and Flowerpot, Woking

The interior of this new estate-type pub built 1985 has been designed as a traditional ale house with flagstone flooring, solid timber posts and beams, fairface brickwork, open fireplace and country-style furniture. The food bar provides traditional 'pub grub'

during all licensed hours. This 'country pub'-type of interior is very popular with the present-day drinkers.

Developed by: Charrington and Co. Ltd
Photographs: LPA International

2. Sources of information

2.01 Internal data sources

Existing company data on similar operations elsewhere has a direct relevance to expansion and development proposals. To supplement standard management information, special surveys may need to be instituted, covering such aspects as:

- *customers*: profiles, average spend, patterns of use,
- *sales*: by area, location, time periods, by product, volume, value, contribution to profits,
- *purchases*: food and beverage costs, price trends, usage rates,
- *production*: equipment inventory, utilisation, new developments, overhead costs (energy, property, maintenance),
- *personnel*: wage costs, on-costs, ratios of

employee costs: sales, training, skills, job specifications,

— *finance*: capital costs, depreciation and discounting provisions, analysis of sales, costs of sales, operating expenses, investment appraisal, returns on investment against time.

2.03 Secondary data sources

Secondary or general sources of information, such as published reports, journals and directories provide a valuable background to market and product research. Amongst the main references for restaurant marketing and development are the following:

Social and economic statistics

Demographic data, including national income and

expenditure surveys, show the relative size and importance of markets and trends in consumption.

Statistics include analyses of censuses, social trends, digests of regional statistics, business monitors, economic trends, national income and expenditure surveys, international passenger surveys and other tourism studies.

International markets and products

An indication of market opportunities and the products and services provided in other countries can be obtained from the information services provided by embassies, consulates and trade delegations, chambers of commerce, and other representative bodies.

National markets and products

Much of the published information on markets, consumer expenditures, developments in food services and equipment and other aspects of business is featured in professional and trade journals.

Specific market surveys

More specific reports on national or international markets are prepared by commercial consultancy companies both for individual clients and syndicated needs, including publication of extracts.

Restaurant guides and directories

Lists of recommended restaurants, hotels, pubs, clubs and other facilities are compiled by bodies like the Consumer Association, Tourist Authorities, motoring and travel associations and telephone guides (*Yellow Pages*). These indicate alternative facilities and standards.

Product standards

Equipment standards and performance specifications are usually regulated by legal provisions (warranties, safety, health, hygiene, fire precautions) and product approval schemes.

European standards for equipment are coordinated by the Comité Européen de Normalisation Electrotechnique (CENE).

2.04 Direct data sources

While secondary information is important in drawing up guidelines on trends and general requirements, decisions on the suitability of particular sites, the market potential, strengths and weaknesses of competition and the best options for development can only be obtained by direct investigation. Direct or original data collection usually involves a combination of methods of observation, enquiry and surveys.

2.05 Observation

Observational techniques are the most widespread; they are relatively simple and expedient and provide some factual basis for what is often an intuitive assessment of a situation. Observation may, however, give a distorted impression if the conditions are not typical and should be carried out over a number of intervals and cover the main meal times, weekdays and weekends and seasonal changes.

- potential sites should be surveyed in detail, noting pedestrian and traffic flows, characteristics of people frequenting the area, local attractions and commercial activities,
- competitive establishments should be visited to assess the customer experience, the nature of the operation (prices, strengths and weaknesses), types of customer and levels of demand.

2.06 Enquiries

Enquiries support observations and cover other aspects of local information, for example:

- tourist office (tourist data, needs, interests),
- planning office (property status, development plans for the area, prospective changes in traffic – such as pedestrianisation – restrictions on access or building alterations),
- chamber of trade (commercial activity, investment trends, range of local businesses),
- local authority information office (property rates and services, economic and social data, local activities, institutions, entertainment and recreational attractions),
- job centre (employment in area, levels of unemployment, availability of staff skills, training opportunities, support schemes).

3. Planning programmes

Design and operational requirements vary widely and the procedures for planning new projects will also depend on the resources of the company involved, and its strategies for development. The following guide outlines the main procedures which are usually involved and key stages where major decisions are required.

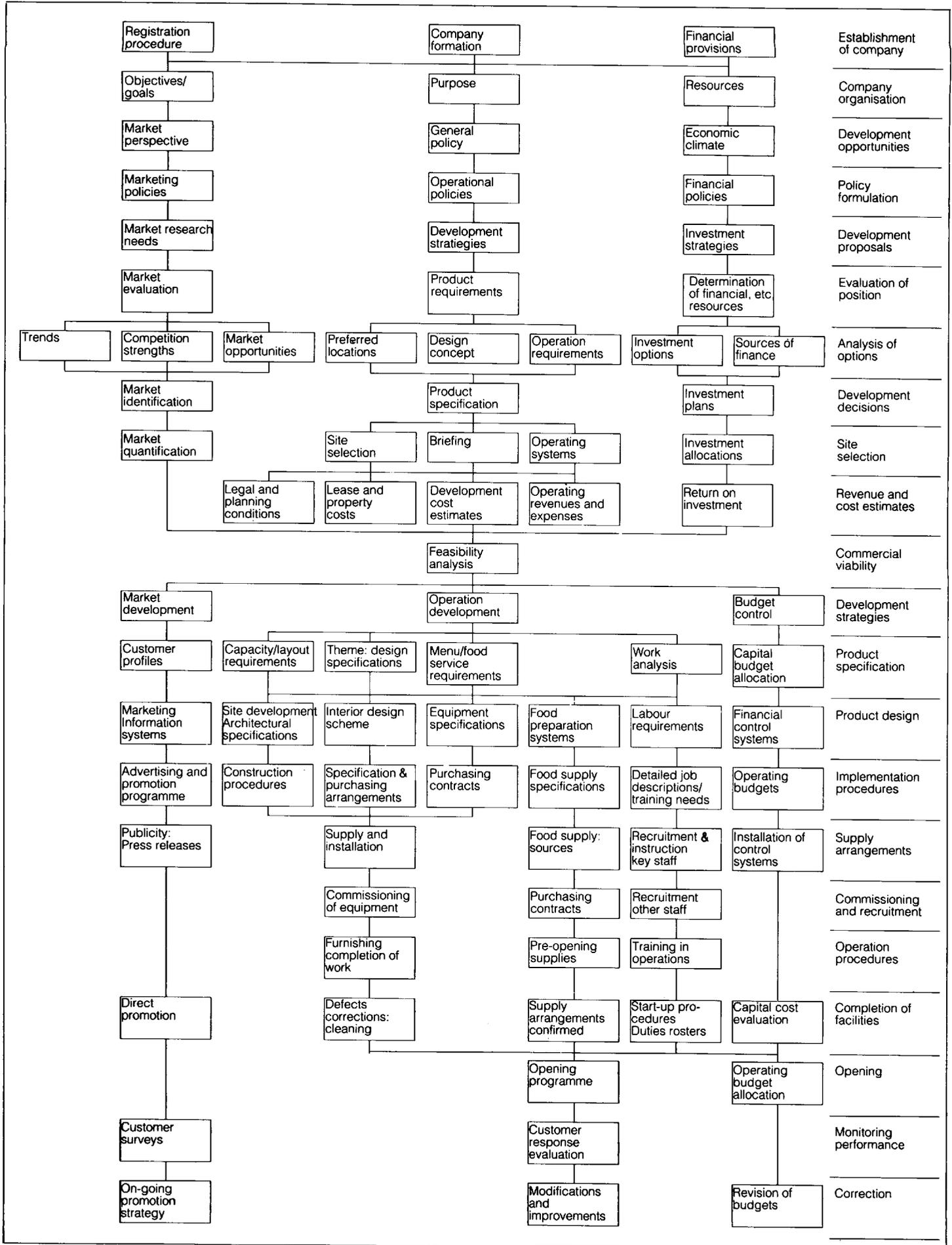
Development programmes can be broadly divided into pre-feasibility (planning) and post-feasibility (implementation) stages (see p. 53).

4. Consumer behaviour

4.01 Influences on consumer preferences and choice

Consumer interests, preferences and motivations are subject to many influences:

- *background*: culture, socio-economic class



structures, reference groups,
 — *individual*: role, status, life style, stage in life cycle,
 — *situation*: circumstances, time, constraints,
 — *information*: promotion, advertising, merchandising.

Some of these influences (culture, socio-economic status) are persistent while others vary from one situation to the next (role playing). All buying decisions are dependent on information, which may be explicit (brochures, menus, experience) or implicit (through merchandising and image presentation). Unlike many other products in which the choice can be made on rational grounds (quality, performance specification, design, price, warranties) decisions on eating out, social drinking, and leisure interests are often conditioned by personal experience and external influences.

A model of buying behaviour is represented in section 5.07.

4.02 Cultural backgrounds

Culture may be defined as the state of intellectual, artistic and social development of a group. It reflects the aggregate of values, perceptions, preferences and behaviours which are acquired through learning and socialisation within the group. Each culture usually contains smaller groups or sub-cultures having more specific identification, socialisation and life styles (e.g. ethnic minorities, religious groups, regional and local variations).

Cultural influences on food, drink and social

values are very pronounced and these are reflected in different national characteristics, religious codes and regional preferences. However, as a result of tourism, immigration, international promotion and multi-national chain operations, traditional products are constantly being adapted and introduced into other societies.

4.03 Socio-economic class structures

Cultural development also expresses the refinement of tastes and manners by which a society can judge standards of learning and behaviour. Virtually all societies exhibit some form of stratification. This may be a reflection of political, religious, racial or caste divisions, but in the Western world it is largely characterised by socio-economic differences.

Socio-economic classifications represent broad bands of people in a society who tend to share similar attitudes, interests and values. The hierarchical order of social classes is largely dictated by such factors as family background, education, occupational status and income.

While the percentages of people within different classes may change with advances in education or as a reflection of demographic changes or economic conditions, the class structure of a society tends to remain an enduring feature.

In the UK six main classes are identified by the behavioural patterns associated with different levels of occupation and income (based on head of household). Similar classifications are used in the USA.

<i>Social grade (UK)</i>	<i>Class status</i>	<i>Outline characteristics</i>	<i>% population</i>
A	UM	Higher managerial administrative	3
B	M	Intermediary managerial, administrative management or professional	14
C ₁	LM	Supervisory or clerical, junior management	22
C ₂	Skilled working	Skilled manual workers	29
D	Working	Semi/unskilled manual workers	18
E	Lowest income level	Casual and lowest grade workers, unemployed, pensioners	14

Source: Joint Industry Committee for National Readership Surveys, NRS, 1985.

<i>Class (USA)</i>	<i>Outline characteristics</i>	<i>% population</i>
UU	Social elite, inherited wealth	1
LU	High income, nouveaux riche	2
UM	Professionals, executives	12
LM	White collar, skilled trades	30
UL	Blue collar, semi-skilled, manual	35
LL	Unskilled, casual workers, unemployed	20

(U—upper, M—middle, L—lower).

Source: Adapted from Engel, J. F., Blackwell, R. D., and Kollat, D. T., *Consumer Behaviour*, London, Dryden Press, 1978.

4.04 Effects of socio-economic divisions

The higher the social scale the more food and drink tend to be regarded in a symbolic fashion to demonstrate refinement of taste, knowledge and status. Those in the higher classes also set standards of reference and fashion for the classes immediately below.

Young people are an exception. They establish their own group structures based on less tangible and less permanent criteria (styles, fashions, interests, emotions) often framed on opinion leaders with whom they can identify (see section 4.08).

4.05 Design implications

As a rule it is not feasible within one design concept to cater for wide differences in social structure, and market segmentation is necessary:

- a restaurant can usually satisfy the needs of two bands of class by deliberately providing a range of choice (*table d'hôte*, *à la carte* menu) and less structured service,
- hotel and club facilities with sufficiently large markets may offer two or more styles of restaurant (with different menus, prices, standards and service),
- market differentiation may be based on time and occasion, for example: business lunches (A-B groups), weekend social events (C₁-C₂), evening visitors, tourists (B-C₁),
- popular restaurants and fast-food outlets usually direct their promotion to a wide social spectrum (young adults, family groups, take-away and home sales).

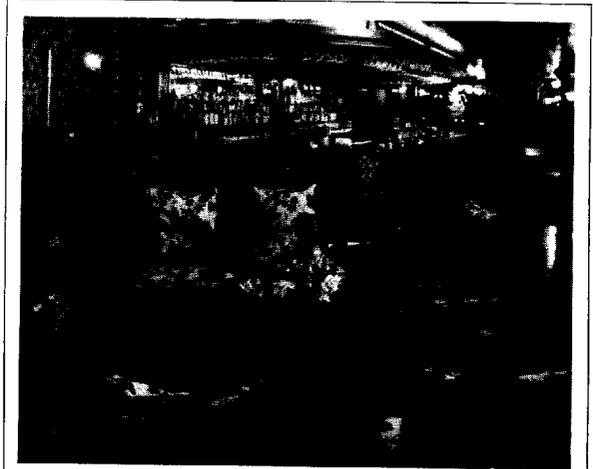
4.06 Reference groups

Individuals tend to adopt similar attitudes, opinions and values to those of people with whom they have close contact, interaction and association. Reference groups may be primary (family, close friends, neighbours, fellow workers) or secondary (professional societies, associations, companies, etc):

- as a rule, individuals desire to conform to and be identified with groups with which they are associated,
- reference groups comprise a major source of business for many clubs, family restaurants, social functions, etc, and are an effective means of promotion (personal recommendations, invitations),
- promotion is generally targeted at the decision makers within the group (strong personalities, event organisers, group secretaries).

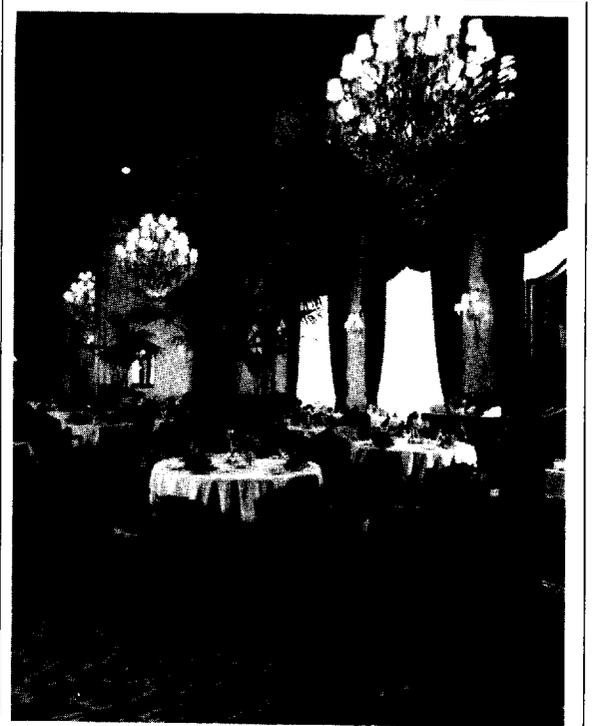
4.07 Age and stage of life cycle

Each life cycle stage can be identified with particular interests and needs. Market segmenta-



Four Seasons Hotel, San Francisco

The French Room: haute cuisine in an elegant setting.



Inn on the Park, Houston: Four Seasons Hotels

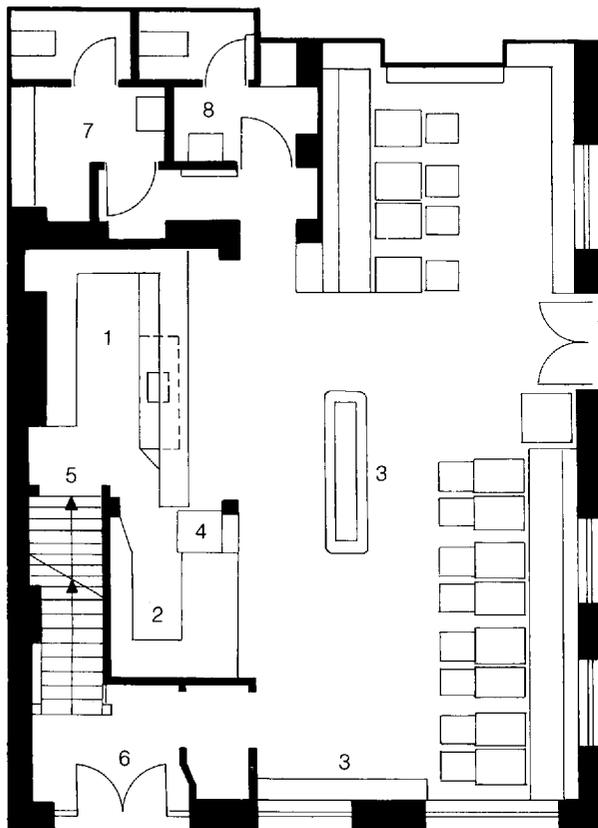
Black Swan Bar: based on a traditional English pub.

tion for commercial restaurants and clubs often shows a clear demarcation between young single people, newly married or courting couples, young family groups, mature women, professional business men, working men, mature couples, and older retired people.

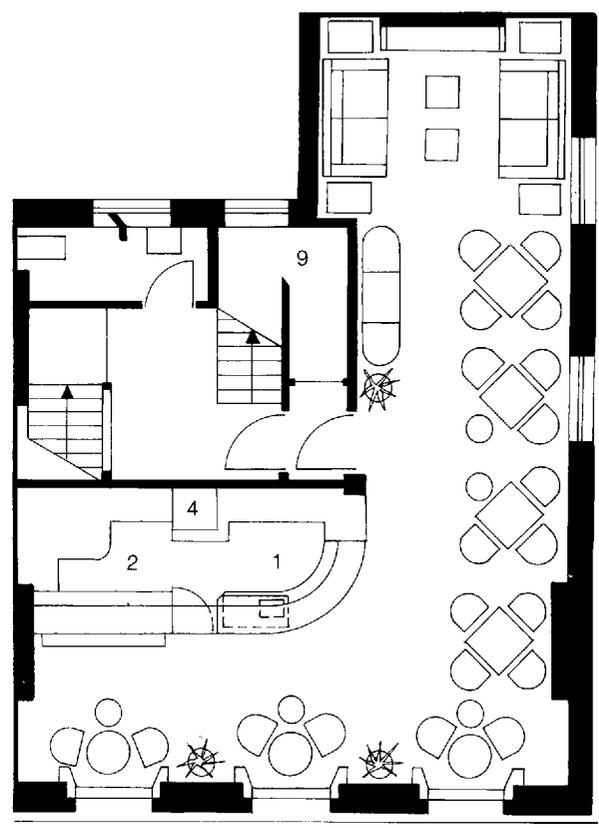
Occupational status and economic circumstances have a significant effect on buying behaviour. Both are broadly expressed in socio-economic classifications although the proportion of disposable income will affect individual spending power.



- 1 Main bar
- 2 Food bar
- 3 Drinks shelf
- 4 Hoist
- 5 Stairs from cellar
- 6 Lobby
- 7 Toilets – male
- 8 Toilets – female
- 9 Store
- 10 Gaming machine



Ground floor



First floor

Running Horse, Davies Street, London W1

This public house is situated close to Oxford Street, London's main shopping street, and in an area densely populated by office and shop workers and property agents.

The brief required that the public bar should be designed so as to attract professional men and women.

The designers provided a dark, clubby, masculine bar (a) equipped with an upmarket carvery/sandwich counter on the ground floor, and a lighter, more feminine bar on the first floor (b). The result has been a great success, and both bars are busy with mixed clientele, with longer evening trading hours than the average public house in the area.

Plans: ground floor; first floor.

Clients: Imperial Inns & Taverns
 Designers: Carmona Dover
 Main contract value: £73,000
 Furniture and furnishings: £20,000
 Equipment: £7,000
 On site: 10 weeks

Individual personalities and life styles may show wide variations from the norms of group behaviour. To a large extent life style is a reflection of personality, character traits and habits which can be measured as psychographic profiles.

4.08 Roles and statuses

An individual's attitudes and responses are largely determined by his perception of the proper behaviour required of the role he is playing at the time. Behavioural patterns thus change from one situation or set of circumstances to the next (business prestige, social enjoyment, family informality, leisure relaxation, formal occasion, travel convenience):

- role playing often involves symbols for identification and conformity (dinner jackets, ties, suits, jeans, design of staff uniforms),
- choice of venue is often strongly influenced by the status accorded to particular types of customers and their roles (personal attention, recognition, degree of formality),
- behaviour is often modelled on opinion leaders (real or characterised) who exhibit the personal success or leadership qualities in the roles which individuals aspire to play. Opinion leaders have a marked influence on fashions, attitudes and consumer trends,
- the experience should be seen to enhance a customer's personality and ego while safeguarding against anxiety, ridicule or loss of prestige (self-concept theory).

5. Psychology of perception, motivation and response

5.01 Perception

Perception is a complex process by which people select, organise and interpret sensory stimulation into a meaningful coherent picture. Throughout their lives people are subjected to a vast number of stimuli competing for attention, most of which are screened out. The stimuli most likely to be noticed and acted upon are those which:

- have an identifiable form or pattern (gestalt psychology),
- stand out amongst the background through contrast or prominence,
- are known to be relevant to a current need or interest (cognition),
- can be anticipated in the situation or circumstances,
- are associated with previous experience providing learning and means of discrimination,
- carry a repeated message which can be committed to memory and reinforced (branding)
- are designed to evoke a set of responses by acting as cues (appetising, appealing),
- induce a strong drive or motivation to actualise a felt need or want (self-image).

Most of the following techniques are employed in restaurant design and promotion:

- a simple, easily distinguished sign or logo is used to identify the character and style of operation and to indicate price level. This is repeated at each point of contact with the customer, on the outside of the building, on doors, menus and promotion material,
- cues include local featured lighting over bars, self-service counters, illuminated displayed menus and features. Gueridon and sweet trolleys and other displays serve a similar merchandising role,
- cues may also be used as directions (stepped lighting in corridors, symbols on toilet doors) and as warnings (illuminated steps, barriers).

5.02 Learning and discrimination

Learning is the acquisition of knowledge which enables an individual to recognise and give a reasoned response to particular stimuli or situations. Learning is conditioned by experience and this, in turn, influences future behaviour. The learning process is aided by reinforcement and association with specific stimuli and cues. Acquired knowledge enables the individual to exercise perceptual discrimination in identifying and selecting the stimuli which respond to his needs or wants; it influences behavioural patterns, such as feeding habits, food tastes and preferences, and leads to the formation of individual beliefs and attitudes towards particular foods and kinds of establishments.

In practical terms, learning processes are important in:

- promoting familiarity with particular products (such as in branding, design, association, image building),
- establishing behavioural patterns (habit formation, brand loyalty, affective connections with the product),
- influencing beliefs and attitudes (value for money, nutritional quality, social benefits).

5.03 Behavioural classification

Consumer buying patterns tend to fall into specific categories.²

<i>Type of response</i>	<i>Customer characteristics</i>
Habit determined	Regular patron. Strongly brand loyal
Product – cognitive	Rational choice. Conditionally brand loyal
Price – cognitive	Dictated by economy. Price sensitive
Impulsive	Reactive to physical appeal. Brand insensitive
Emotionally reactive	Influenced by promotion. Image responsive

5.04 Needs and wants

A want is a desire for some specific item (hamburger, sandwich, etc) which will satisfy a need (for food). Demand is a want supported by purchasing power.³ Wants and needs vary from one situation and occasion to the next.

At basic level time and cost constraints may dictate choice; at the other extreme the social benefits may be more important. Needs can generally be graded as follows.⁴

Physical: *physiological* – food, drink, refreshment, change of surroundings; safety and security – confidence in standards, hygiene, quality, prices.

Social: *belonging* – identification with type of establishment and clientele; esteem and status – acknowledgement of status, personal attention; self-actualisation – personal achievement, broadening of experience.

5.05 Motivation

Motivation is a process, or series of processes, which drives a goal-directed sequence of behaviour. It is stimulated by a sense of need or desire that prompts a person to act. The type of response will depend very much on attitude, personality and aspirations of the individual concerned (see section 4). Choice is usually motivated as much by psychological, emotional and social needs as by the basic instincts of hunger and thirst.

Instinct theories seek to explain goal-seeking behaviour in terms of instinct or pre-disposition. Instincts tend to direct responses to fundamental needs (such as hunger, thirst, curiosity, self-assertion). Impulsive buying decisions can be stimulated by the attractive display and smell of food, by appetising photographs and the sight and sound of enjoyable activity.

Psycho-dynamic theories, as postulated by Freud, consider the mind to be in a constant state of tension between repressed urges for gratification and pleasure and the need to conform to the standards of conduct set by social and cultural values. Subconscious desires may manifest themselves in the need for social and physical contact, for romanticism and fantasy, and explain preferences for strong (masculine) or delicate colours, dominant forms and other expressive features in design.

Cognitive theories are founded on the assumption that individuals have a perception of their own needs and their actions are, or can be, directed towards satisfying them. The objectives in promotion and merchandising are to motivate potential customers to move from cognition (awareness, knowledge) to affection (desire, liking) and conation (action, conviction). Design can contribute by creating interest, showing benefits and making it easy and justifiable to respond.

Expectancy value theories maintain that motivation is a joint function of expectancy and the value attached to particular outcomes. Product design and merchandising are concerned with reinforcing the sense of expectancy and awareness of value (value for money, social atmosphere, enjoyment of occasion). Expectancy values are also the basis of motivation for staff (reward, acknowledgement).

5.06 Post purchase considerations

The feelings of the customer after the experience are likely to have a lasting influence on future attitudes. This is particularly important in chain restaurant operations and branded products. Cognitive consistency applies when beliefs about a product are effectively reinforced by experience. Cognitive dissonance may result when there is evident inconsistency or incongruity between beliefs, knowledge and the value of the experience. This may lead to customer alienation (against the restaurant or the whole chain) or doubts which need reassurance.

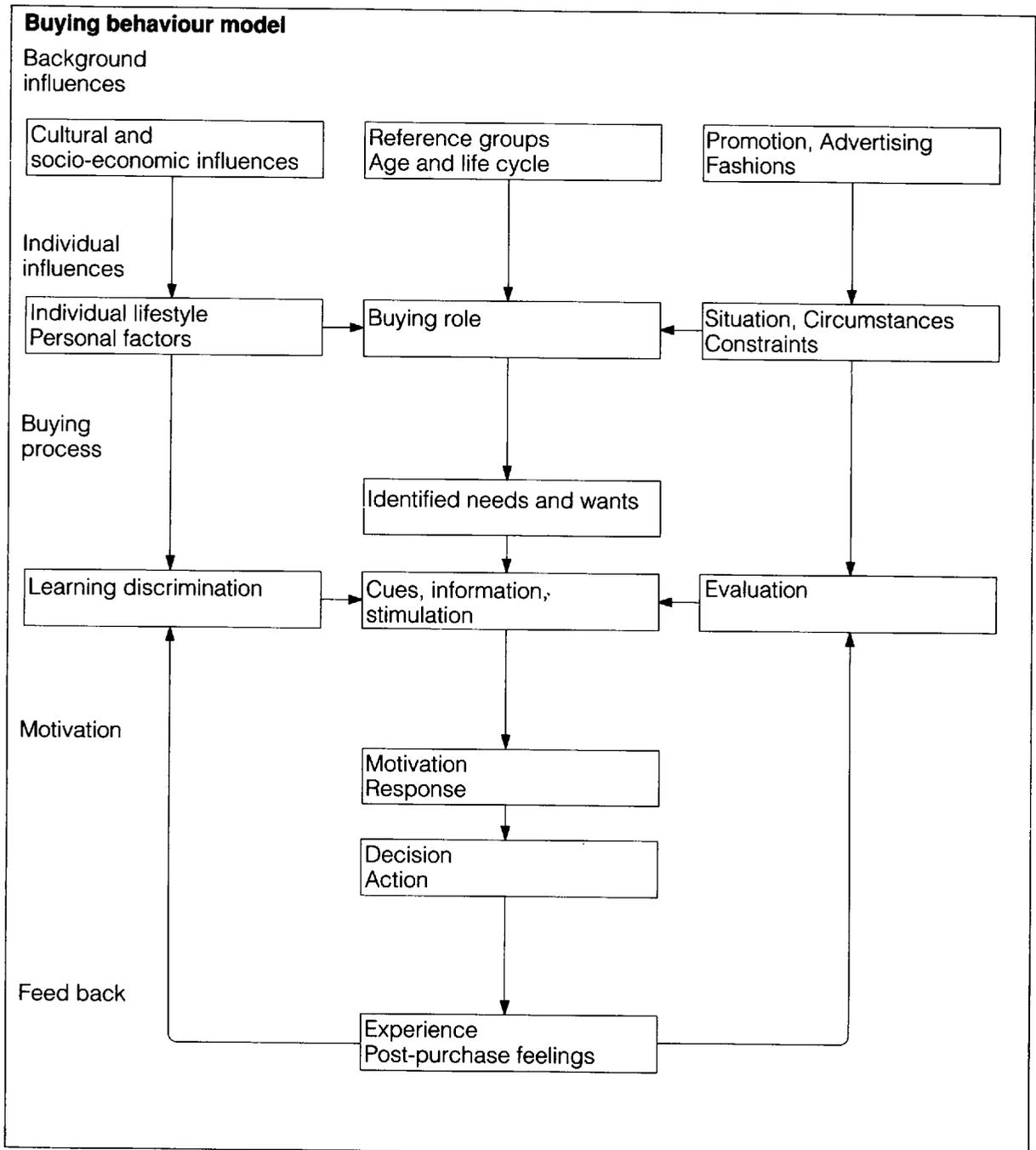
In chain operations, positive steps must be taken to avoid dissonance by:

- defining precise standards which must be adopted in every restaurant (design and operation),
- strict maintenance of quality and performance,
- accurate portrayal of the product in publicity material,
- staff training at all levels,
- attention to complaints, positive response to criticism,
- follow-up monitoring of attitudes and impressions,
- featuring satisfied customers in publicity/promotions,
- establishing an emotional or affective connection (cathexis) between the product and consumers (recognition, reminders, mementoes).

5.07 Models of consumer behaviour

Composite models of consumer behaviour^{5,6} examine the way inputs of information interact with personal needs and exogenous circumstances in motivating responses. A simplified model is illustrated below.

Other approaches to modelling consumer behaviour include use of computer flow charts, attitude formation and change, and sequential analysis.⁷



6. Techniques of merchandising

6.01 Alternative approaches

The approach may be to emphasise overall value (quality of food, reasonable price, good atmosphere, convenience, varied menu) or to stress particular attributes or benefits which are rated as the most important for the market concerned.

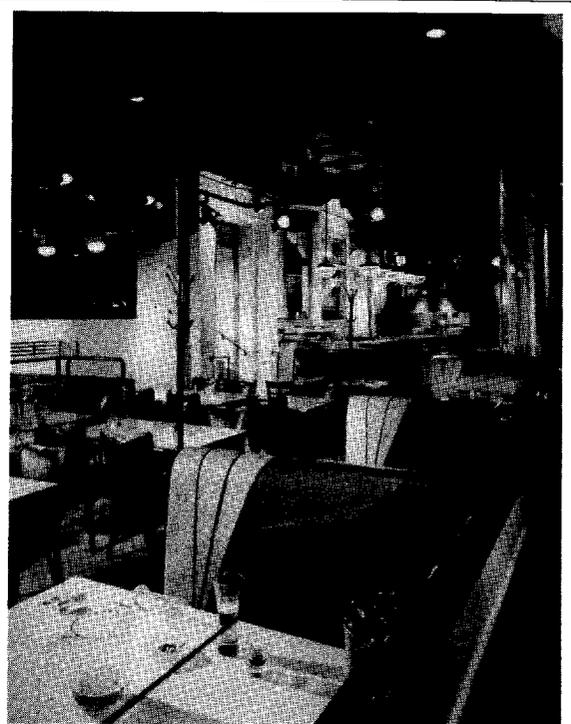
Selective promotion is particularly important in differentiating products in a highly competitive situation (similar fast-food operations) and where there are locational or price disadvantages.

Selective emphasis is usually concentrated on one or more of the following features:

Emphasis	Examples of specific features
<i>Food choice, menu variety</i>	
Appetising displays	Cafeteria, buffets, salad bars,
Self selection of food	carveries, sweet trolleys, variations in meal and portion choice, children's menus
<i>Assurance on standards</i>	
Hygiene, cleanliness	Branded products, standard-
Efficient manage-	ised functional designs, set ment operating procedures, en-
	forced controls
<i>Competitive pricing</i>	
Value for money	Photographs of priced dishes and menus
No hidden extras	Product differentiation by weight, quality dressings

<i>Convenience</i>	
Minimum queueing	Fast-food units, food courts, multiple serving counters Systemised production with output geared to demand
Quick service	
<i>Friendly service</i>	
Pleasant staff	Selection and training procedures, staff facilities, style of uniforms.
Customer attention	Organisation, rostering, appropriate supervision and reward
<i>Social atmosphere</i>	
Social participation	Counter and grouped seating, inter-related space and activity
Vitality and animation	Focuses of interest, displayed service, varied lighting
<i>Attractive surroundings</i>	
Refreshing environment	Landscaped interiors with cool delicate colours and forms
Comfort, relaxation	Homely decor, domestic style furnishings, personalised areas
<i>Prestige, status</i>	
Sophisticated setting	Elegant design, spacious layout, individual attention
Gourmet food	Elaborate menu and table setting, gueridon and silver service
<i>Broadening of experience</i>	
Variety in eating out	Strongly themed designs, featured skills, exotic lighting
Entertainment dining	Stage, music and dance facilities, cocktail bar, grouped seats

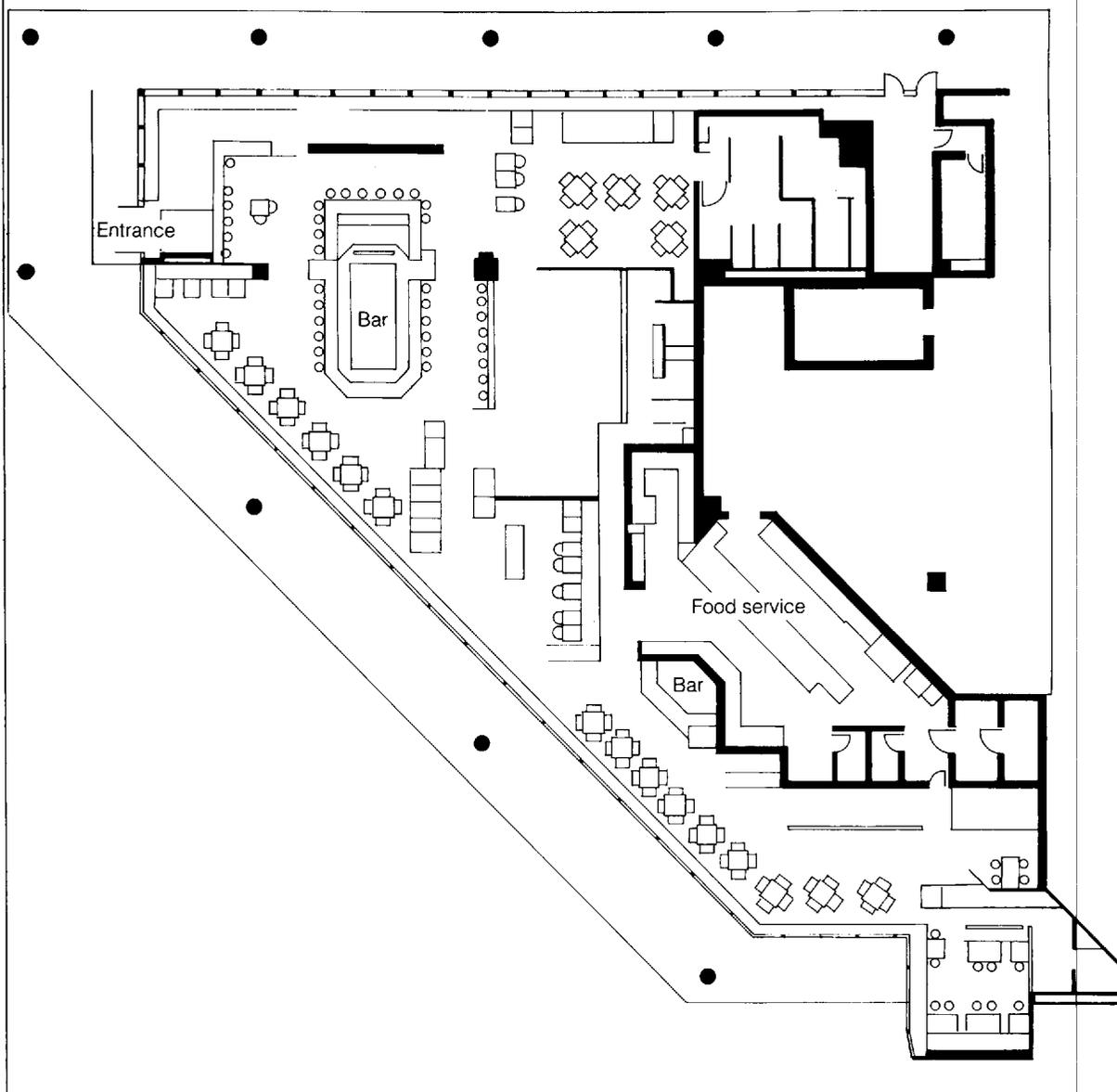
1. Doswell, R., and Gamble, P. R., *Marketing and Planning Hotels and Tourism Projects*, London, Hutchinson, 1979, pp. 25–6.
2. Woods, W. A., 'Psychological Dimensions of Consumer Behaviour', *Journal of Marketing*, Vol. 24, January 1960, pp. 15–19.
3. Kotler, P., *Marketing Management: Analysis, Planning and Control*, 5th edn, Englewood Cliffs, N.J., Prentice-Hall, 1984.
4. Maslow, A. H., *Motivation and Personality*, London, Harper and Row, 1954.
5. Howard, J. A., and Sheff, J. N., *The Theory of Buyer Behaviour*, New York, Wiley, 1969.
6. Engel, J. F., and Blackwell, R. D., *Consumer Behaviour*, 4th edn, London, Dryden Press, 1982.
7. Baker, M., *Marketing – An Introductory Text*, 3rd edn, London, Macmillan, 1979.



Pete and Marty's, Toronto, Canada

An award-winning design of a bar-restaurant which combines touches of Art Deco with stark modern fittings and textures. This uncompromising but exciting setting is highly popular with a young, classless society. Studio, spot and suspended lamps suggest a sense of theatre and activity is emphasised in the neon signage.

Designers: Di Leonardo International Inc
Photographs: Warren Jagger



4

Planning

1. Locational requirements

1.01 Planning considerations

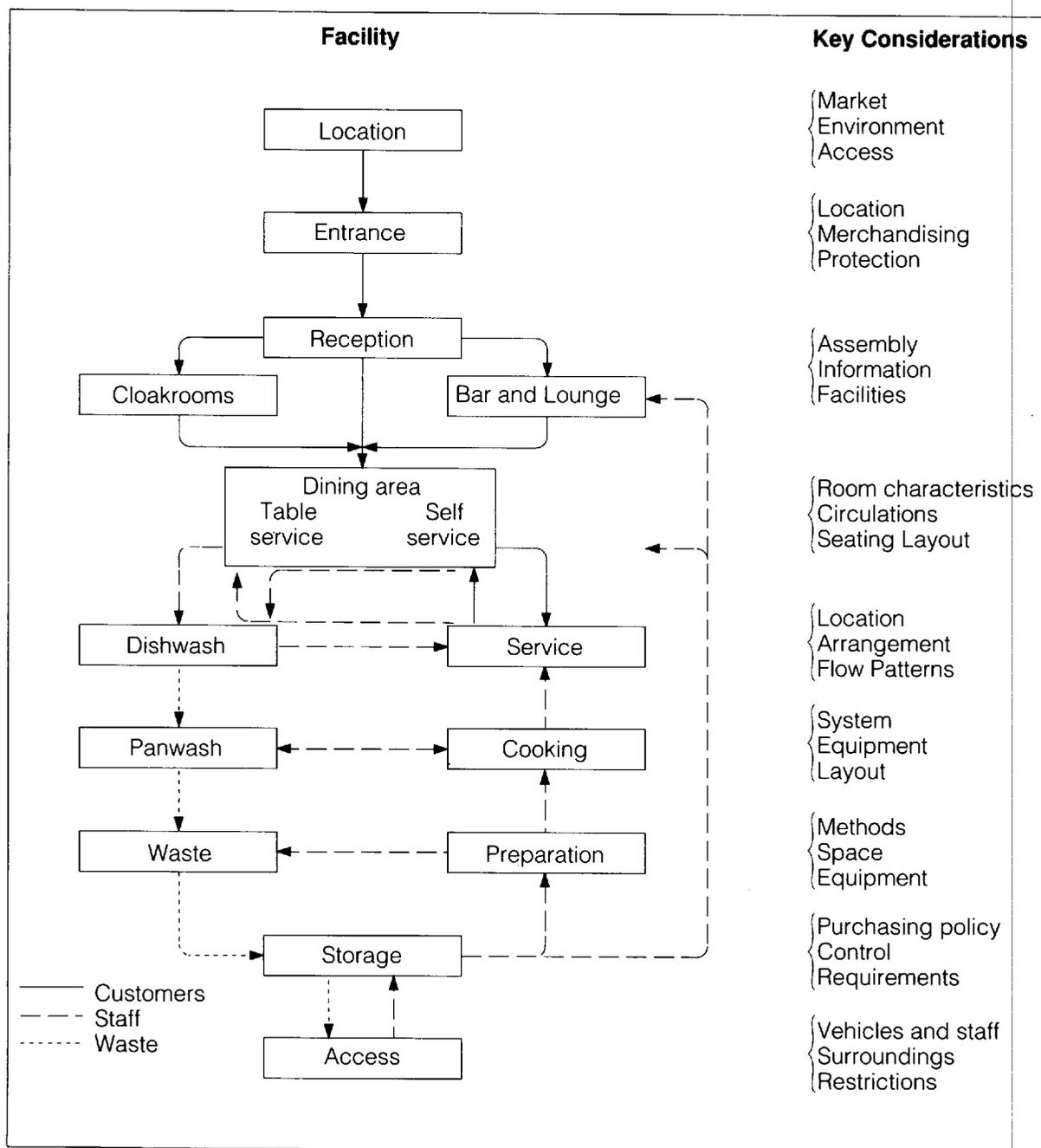
Restaurant planning involves an assessment of needs and priorities arranged in a proper sequence. Operational needs such as convenient access for customers and goods are also largely dependent on external factors, particularly the relationship between the premises and its surroundings.

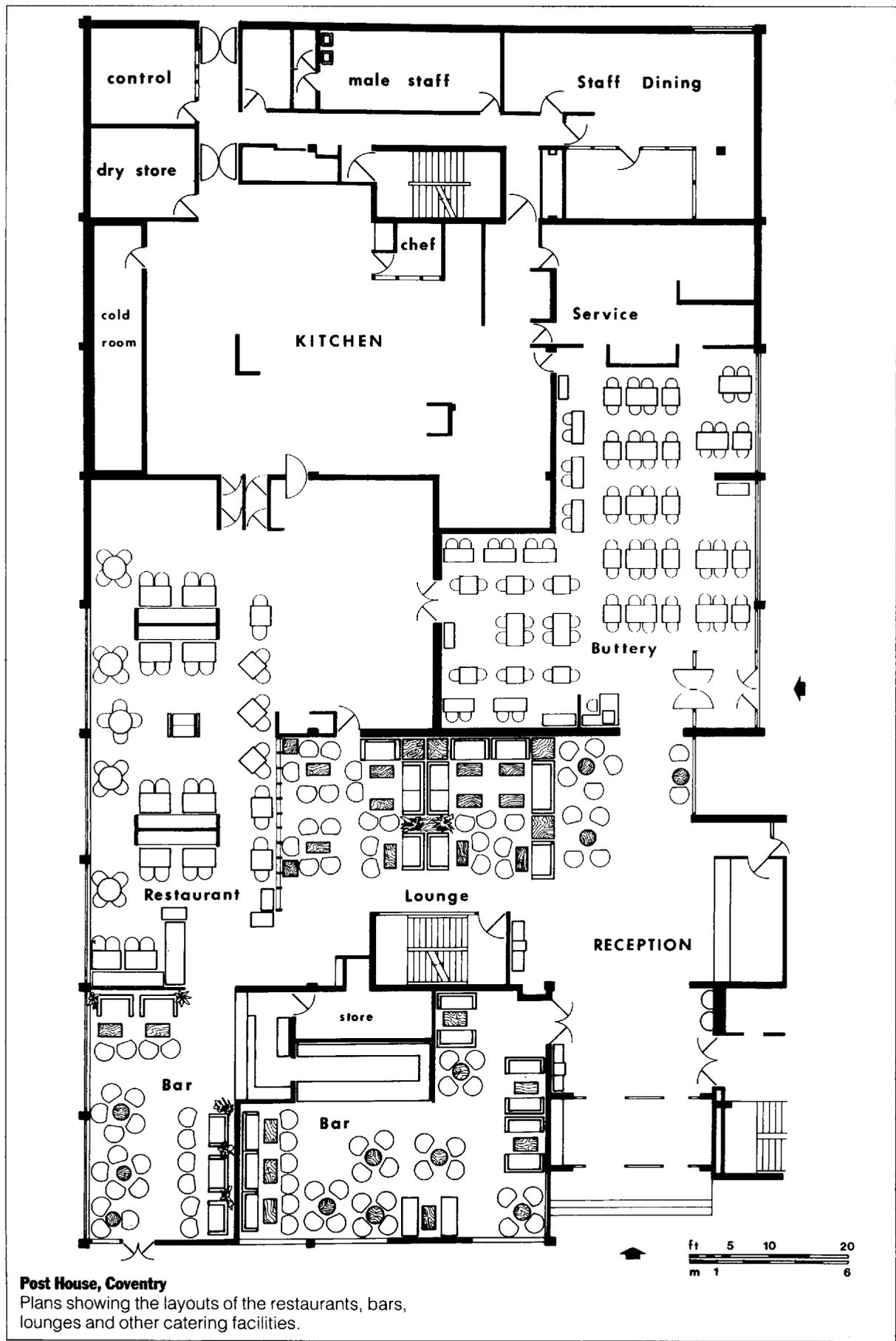
Broadly similar requirements apply to clubs and leisure facilities but separate access, equipment storage and dressing areas are also necessary for entertainment and recreation use.

1.02 Functional relationships

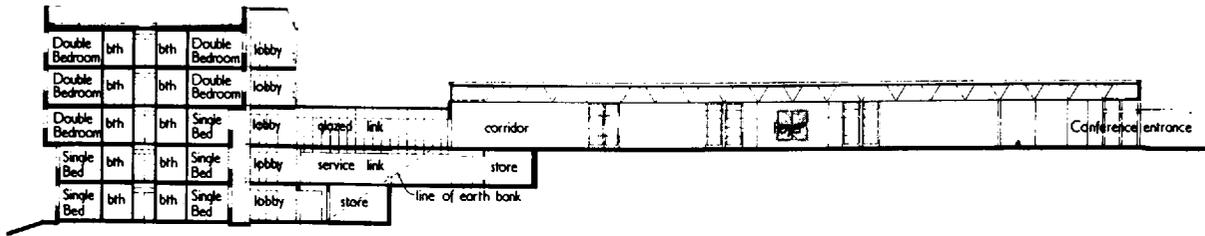
In a single restaurant operation the storage, preparation, service and dining areas are usually adjacent. For snack bars and bistro-type restaurants operating a limited menu, where space may be at a premium, cooking and service may be carried out within the dining area using counter and back-bar equipment as a feature of the design.

Many restaurants, such as those in hotels, hospitals and entertainment complexes, are operated on a multi-choice system, each offering a different style of service with an appropriate menu and price range. To facilitate multi-outlet operations, the layout may provide (see p. 66):



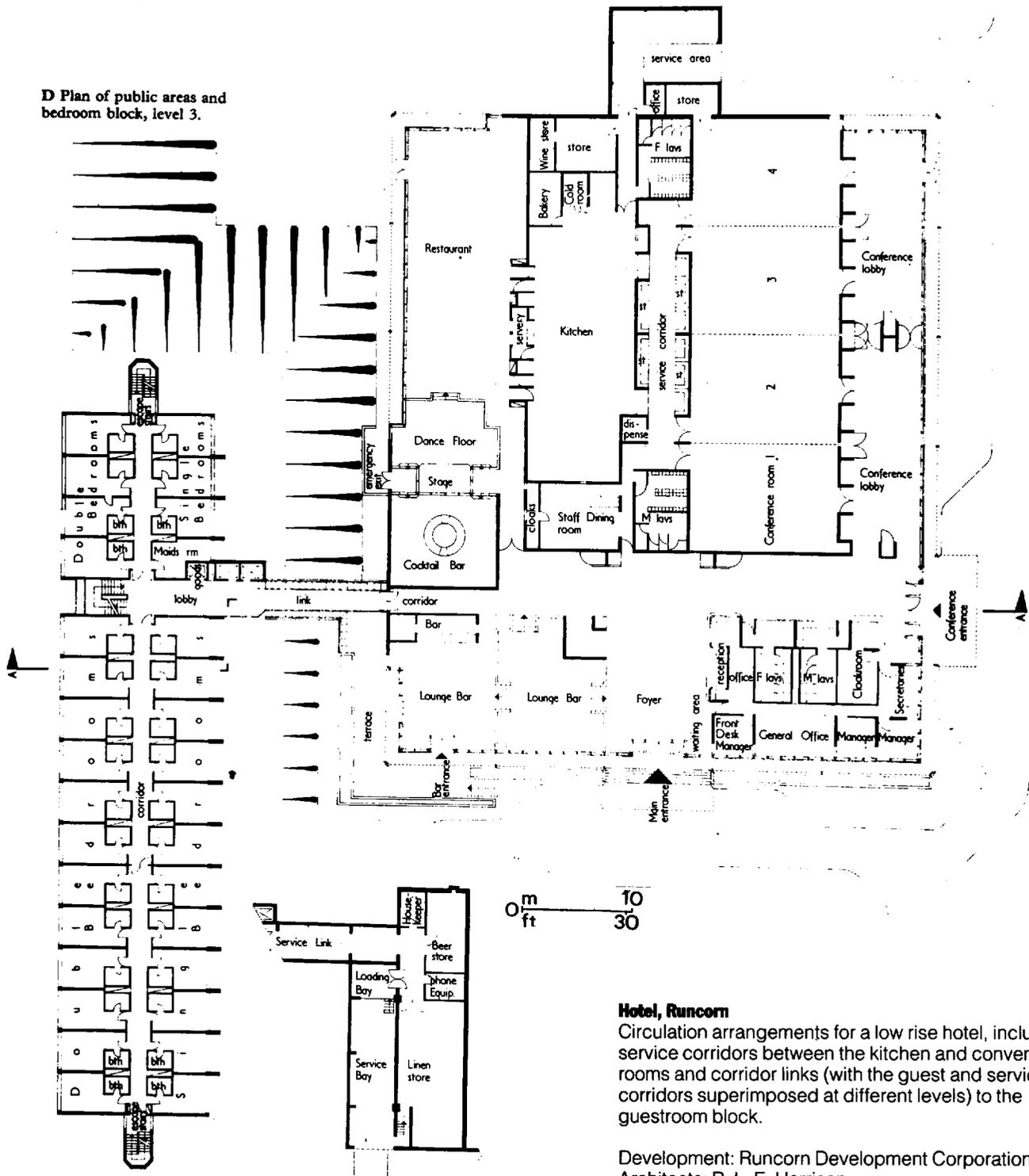


Post House, Coventry
Plans showing the layouts of the restaurants, bars, lounges and other catering facilities.



C Section AA.

D Plan of public areas and bedroom block, level 3.



Hotel, Runcorn

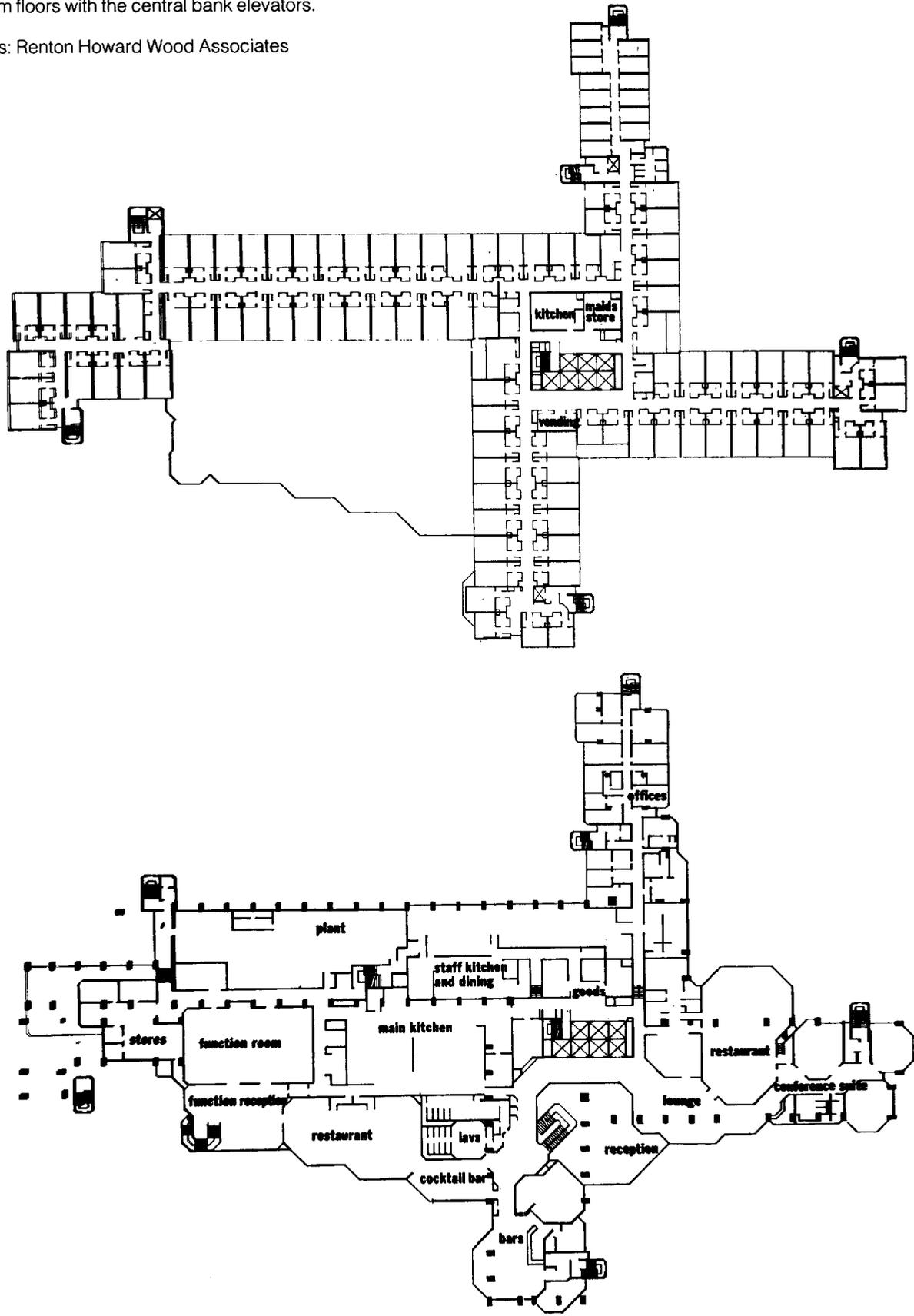
Circulation arrangements for a low rise hotel, including service corridors between the kitchen and convention rooms and corridor links (with the guest and service corridors superimposed at different levels) to the guestroom block.

Development: Runcorn Development Corporation
Architects: R. L. E. Harrison

Tower Hotel, London

Relationship of the first-floor service areas and guestroom floors with the central bank elevators.

Architects: Renton Howard Wood Associates



- central location of the main kitchen allowing direct service to adjacent restaurants. The kitchen may include storage at the same level or be supplied by elevators from basement stores,
- centralisation of main production with distribution of the prepared food to smaller finishing kitchens in other parts of the premises – including pantries for room or ward service,

Central production may be based on:

- commissary system – central preparation of some items (bakery, butchery, vegetables) distributed fresh or chilled,
- cook-freeze – central production of cooked food which is then frozen for extended storage,
- cook-chill – central production of food which is then chilled for use within two to three days,
- assembly-serve – food supplied to the premises ready prepared (convenience foods) for finishing and service.

Technical details of food production are given in Chapter 8.

1.03 Location

Location is a vital factor in the success or failure of a restaurant and it must satisfy four main requirements: market potential, accessibility, development capability and feasibility.

<i>Particular considerations</i>	
<i>Market potential</i>	
Size and characteristics of markets likely to be attracted.	Extent of competition. Gaps in product supply. Target markets.
Their interests and motivations.	Attractions of locality (see Chapter 3, section 3.02).
<i>Accessibility</i>	
For customers, including available parking.	Difficulties of access, road crossings, restrictions on parking.
For supplies.	Height, width or time restrictions on vehicles access or unloading.
For utility services.	Adequacy of drainage and supplies, wayleaves for services.
<i>Development capability</i>	
Scope for alterations.	Leasehold conditions, property easements. Planning and zoning requirements. Building restrictions (Preservation or Conservation orders) and company policy.
Space for future expansion and associated needs.	Site area and plot ratio limitations. Agreements with adjoining property. Protection of views and other benefits.

<i>Feasibility</i>	Landscaping and terracing options.
Capital development costs.	Levels of funding and loan finance. Interest charges, pre-opening expenses.
Life cycle for investment.	Leasehold period, conditions. Planned replacement, refurbishing.
Return on capital and level of profitability.	Anticipated turnover rates, volumes of sales, gross operating profits, administrative and fixed costs. Net returns (see Chapter 2, section 6.10).

In broad terms food and drink services need to be associated with centres of interest and activity which attract people. The particular circumstances which will influence consumer choice include:

- situation, whether at home, at work, travelling on holiday, out shopping or sightseeing,
- occasion, in seeking social company, business, quiet relaxation, seclusion, escapism or entertainment,
- need, for economy, speed, convenience, rest or stimulation, diet or sustenance.

1.04 Promotion: locational requirements

Precise location may be critical in serving the needs of a particular market and in generating a sufficiently high volume of sales. In other cases, compensating features may be used to offset locational disadvantages.

<i>Type of premises</i>	<i>Specific requirements</i>
High volume fast-food outlets.	To achieve the required turnover, including take-away sales, prime high street siting is usually essential. Preferably near major street junctions
Large scale operation	
Medium scale, franchised. Fast-food outlets	Located near concentrated commercial activities and along main routes leading to city centres. Long opening hours usually necessary to ensure sales volume
Chain restaurants – for travellers	Along motorways catering for family and general needs. Positioned and designed so as to be seen by passers-by. Usually associated with garage or hotel facilities for mutual benefit. Prime positions near motorway intersections
Chain restaurants – in urban areas	In main commercial and tourist areas with high population density. Near local attractions, in shopping precincts and stores

Individual restaurants – in urban areas	Usually in lower rental small properties off the main streets, in historic areas or those associated with tourist attractions. May rely on character or reputation to generate custom
Individual restaurants – in non-urban areas	Mainly combined with recreation or leisure facilities in country clubs and hotels. May be located near local sightseeing attractions and tourist centres. Feasibility may be affected by seasonality or extent of use
Restaurants in hotels catering for non-residential market	Must have a distinctive entrance direct from main lobby or adjacent street. For restaurants on other floors a direct elevator or escalator service is essential. A speciality restaurant is usually more easily marketed
Restaurants in stores, theatres, clubs, leisure complexes	Sited to provide best views of exterior, interior concourse, activities or interests. Multiple outlets with snack, self-service and table service may be provided. Circulation planning for peak flows of customers and for supplies to locations for food services is essential
Restaurants in pubs, wine bars, bistros, inns	Attracts wider range of customers, particularly lunch-time trade. A separate counter section with back-bar equipment and extension or conversion to provide dining area is usually required. Space is often restricted

1.05 Aspect and view

The relative importance of a view will depend very much on the type of restaurant, its main period of use and the extent to which interest and attraction is provided within the interior of the room itself. Generally, when a view from a restaurant is outstanding the aspect should be emphasised by the position, shape and design of the room and in the layout of the tables.

A view may be natural or created artificially by landscaping and ornamental work. Gardens, lawns, terraces and swimming pools may provide an extension of the restaurant activities (receptions, parties, barbecues, satellite bars for day time or flood-lit recreational use). Recreational facilities may be partly financed by providing associated profit centres (restaurants, bars, etc).

Depending on location, features of interest may be provided by:

- water – movement, changing character, tranquillity,
- natural environment – distant vistas, rural scenes, parks and gardens,
- urban scenes – historical settings, watching people, townscapes,

- recreational activities – swimming, sailing, skiing, children's playing areas,
- local attractions – harbours, traditional crafts, markets, squares.

There may also be man-made attractions, such as:

- landscaped areas – atria, courtyards, recessed areas, gardens,
- leisure areas – pools, rinks, areas connected with sporting or spectator events,
- extensions – greenhouses, terraces, piazzas,
- internal features – displays of food, fruit, flowers, antiques, models,
- wall hangings – paintings, tapestries, screens, murals.

1.06 External façade

The façade of the premises plays an important part in selling the restaurant to potential customers and its message should be stated directly and by association. The exterior design should aim to:

- create awareness,
- generate interest and response,
- identify the character,
- indicate standards.

To a large degree these needs are inter-related but they also follow the steps involved in making buying decisions. (See Chapter 3, section 4.01.)

For *high-quality dining* the exterior may suggest exclusiveness, with a traditional façade and a relatively modest sign. The emphasis is on elegance and good taste. Windows are usually draped to provide privacy and the main feature of awareness is usually an impressive entrance with a sophisticated menu display and staff in attendance.

A *popular restaurant or coffee shop* catering for less formal market needs may well have large windows specifically to show the style and character of the interior and, to some extent, the type of occupants and social atmosphere created.

In *fast-food outlets* the entrance is large, often recessed and open, providing a direct visual link between the exterior and the service counter, thus promoting impulse buying and counter sales.

Speciality restaurants rely on creating a particular image or aura and this must feature in the exterior design. Ethnic restaurants are often traditionally designed and decorated.

Limited menu restaurants specialising in particular foods (pizza houses, crêperies) may base their design on the country of origin or some other food association.

Chain restaurants rely on brand identification and distinctive styling and graphics are important to ensure recognition. Such a corporate image covers all display materials, including menu design, and within the constraints of existing premises, design features in windows, doors and

signs. In new premises it may dictate the shape and construction of the building.

Public houses, inns and clubs are usually more individual in character and design. The emphasis may be more on historical features and other particular associations. However, within that framework most breweries and hotel groups adopt a consistent style for their food service outlets.

1.07 External lighting

Apart from its obvious function, lighting is also used to make the premises more conspicuous at night, to invite customers in, to provide safety and security and to create a change in emphasis and atmosphere for leisure dining in the evening.

Examples of lighting schemes include:

- externally or self-illuminated signs (subject to planning approval),
- building and landscape floodlighting using suitably positioned angled and blended luminaires,
- concealed strip lighting within the building above the entrance and curtained windows,
- free-standing columnar and pillar lamps in car parks and connecting pathways.

Entrance lighting should be provided for:

- *transition*. Level of lighting graded from external conditions (day or night use) to 100 lux (restaurant) or 150 lux (fast-food servery),
- *colour grading*. Soft yellow incandescent lighting gives an impression of warmth and hospitality. Colour grading of fluorescent is critical,
- *menu display*. Direct lighting (with screened luminaires) draws attention and permits reading of the menu (300 lux).
- *Safety*. Steps must be clearly visible and without strong shadows. Recessed side luminaires can be used to indicate unexpected steps or projections.

The visibility of featured lighting over bars, counters and displays is also particularly important.

1.08 External signs and activity

Awareness and interest can be stimulated by suitably designed and positioned signs and by activities extending outside the building. Encroachment on public space, in front of building lines or on other people's land will require specific authorisation by agreement or easement.

The use of signs and advertisements is generally subject to local planning control, particularly if they are illuminated, sited on other land or in environmentally sensitive areas.

External activities (colour, activity, people)

- forecourt or terrace seating with bright



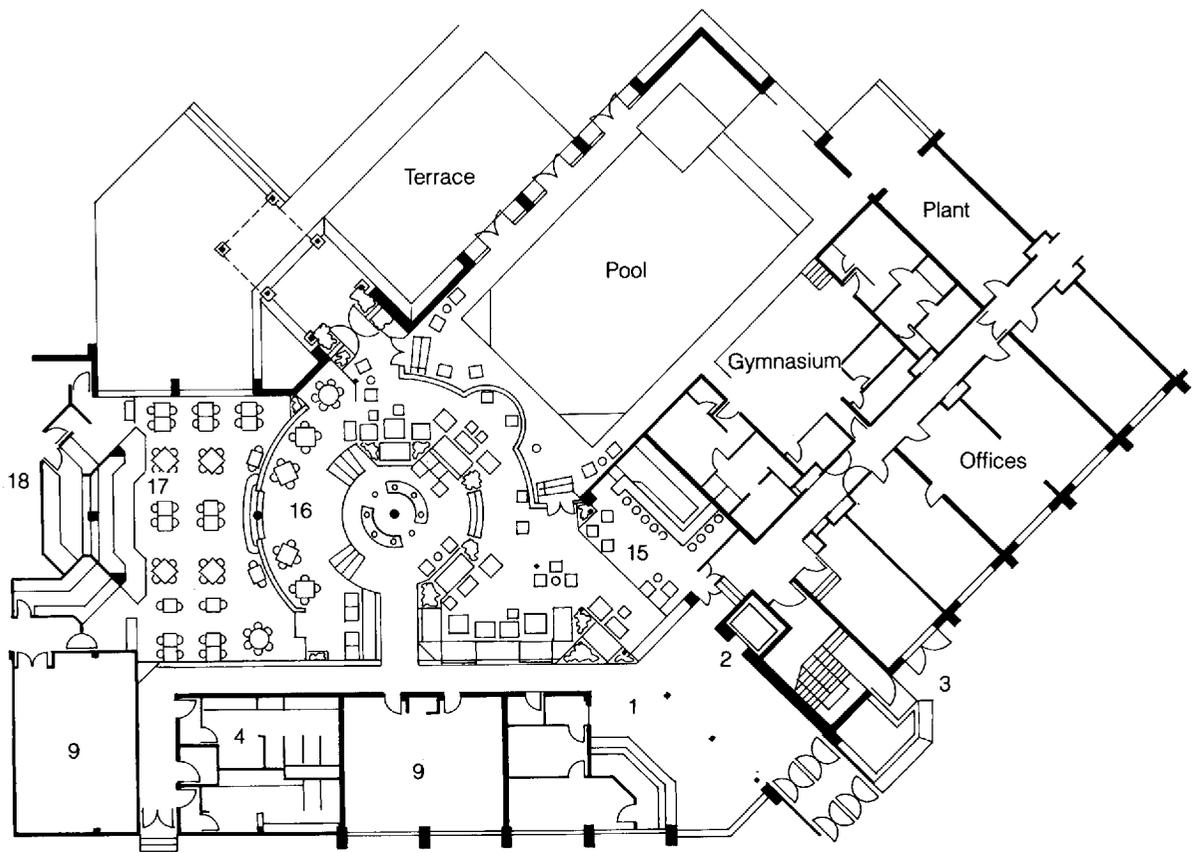
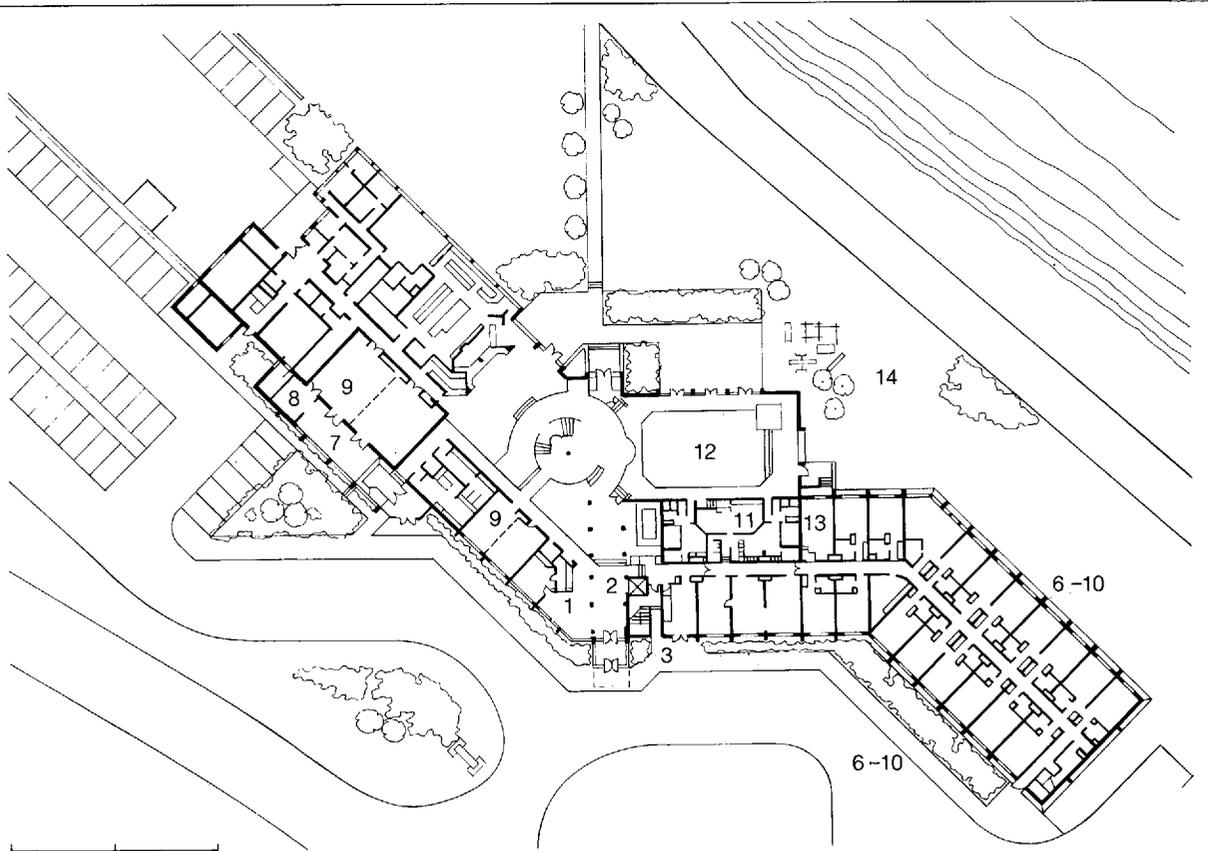
Post House, Lancaster

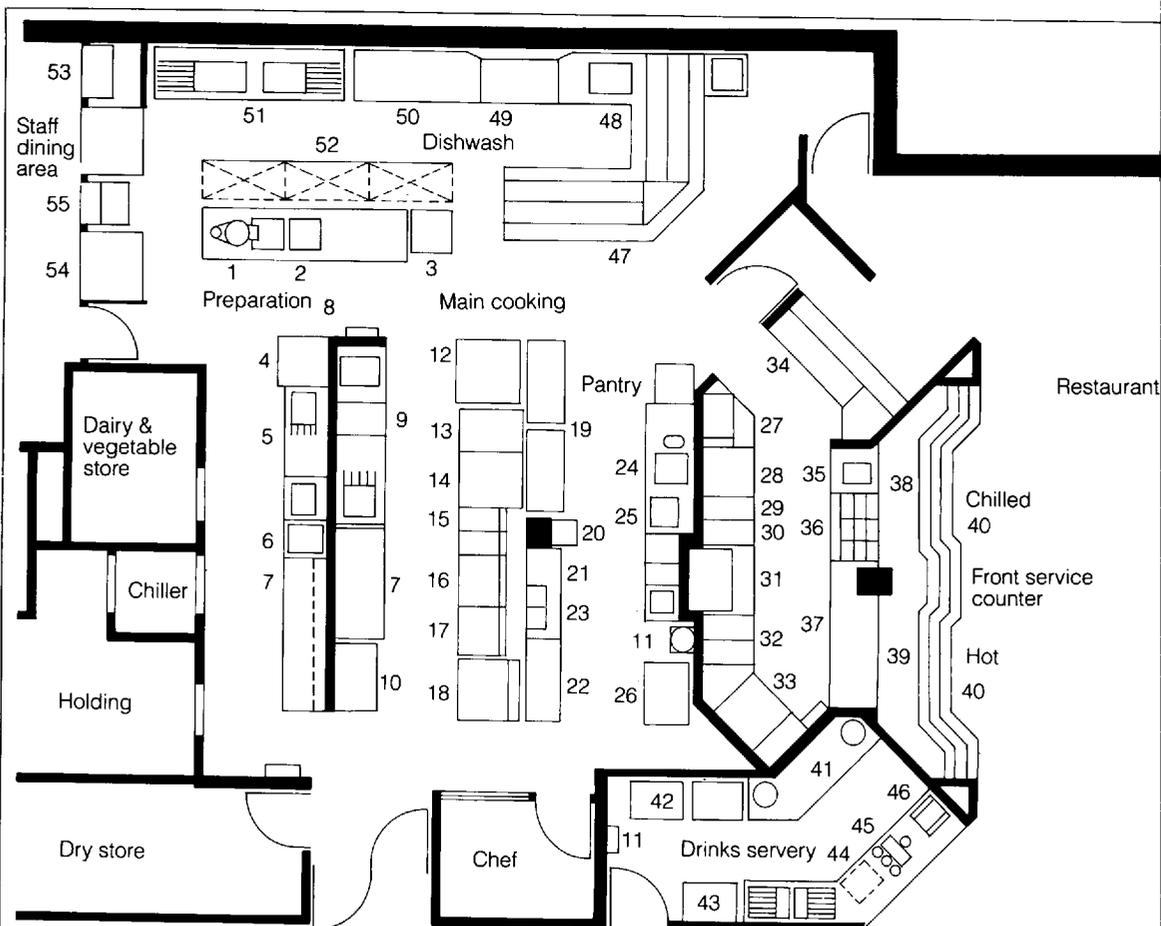
One of the first of a new generation of Post Houses designed to cater for business travellers and leisure needs. The restaurant, terrace and cocktail bar are grouped around the swimming-pool with a view of the river in the background. A particular feature of the restaurant is the attractive display of food with a self-help carvery service. Salad counters are kept chilled by downward distribution of cold air within the display unit and the shelves are stepped for presentation and convenience.

Hotel architects: Cobban and Lironi
 Food service planning: Trust House Forte
 Interior designers: Ezra Attia Associates

Key

- | | |
|---|---|
| Hotel facilities | Food storage |
| 1 Reception desk & front office | 19 Wine & beer stores |
| 2 Lift & invalid hoist | 20 Cold stores deep freeze & dry stores |
| 3 Fire exit | |
| 4 Toilets & powder room | Staff areas |
| 5 Housekeeping | 21 Staff changing rooms |
| 6 Family, twin & disabled bedrooms | 22 Personnel & control |
| | 23 Staff dining |
| Meeting & Function Rooms | Hotel servicing areas |
| 7 Entrance foyer & anteroom | 24 Loading bay |
| 8 Chair store | 25 Electricity sub-station |
| 9 Meeting & boardrooms | 26 Plant room maintenance |
| 10 Syndicate rooms | 27 Switchroom & PABX |
| Fitness & leisure facilities | 28 Laundry |
| 11 Gymnasium & changing rooms | 29 Service lift |
| 12 Pool | |
| 13 Filtration plant | |
| 14 Children's play area | |
| Food preparation & Service | |
| 15 Cocktail bar | |
| 16 Restaurant | |
| 17 Display servery | |
| 18 Main kitchen | |





Preparation area

- 1 Potato peeler
- 2 Double sink
- 3 Slicer/cutter
- 4 Wet fish cabinet
- 5 Single bowl sink in workbench
- 6 Mixer
- 7 Mobile work benches
- 8 Cutter
- 9 Slicer
- 10 Oven rack
- 11 Wash-hand basin

Cooking area

- 12 Convection oven
- 13 Boiling pan
- 14 Tilting bratt pan
- 15 Fryer
- 16 Boiling top
- 17 Solid top
- 18 Convection oven

Pantry area

- 19 Mobile racks
- 20 Waste bin
- 21 Mobile bench with two toasters
- 22 Mobile bench with hot cupboards
- 23 Ice cream cabinet
- 24 Beverage counter with drinks dispenser, water boiler and coffee machines
- 25 Milk and juice dispense
- 26 Mobile rack holding unit

Finishing area/back-bar equipment

- 27 Microwave oven over

- refrigerated cupboard
- 28 Boiling top
- 29 Fryer over hot cupboard
- 30 Worktop
- 31 Broiler over deep-freeze cupboard
- 32 Double fryer
- 33 Convection oven over counter unit

Main servery

- 34 Display shelves over hot cupboards
- 35 Inset sink
- 36 Counter top with inset trays and cutting boards over chilled drawers
- 37 Plain top over chilled drawers

- 38 Front service counter with chilled air circulation
- 39 Front service counter with quartz heating elements
- 40 Tray rest. Glass sneeze guards angled over food display

Drinks servery

- 41 Optic stands over back counter units
- 42 Wine storage refrigerators
- 43 Ice-making machine
- 44 Glass washer under counter
- 45 Ice well and inset cocktail pans in counter

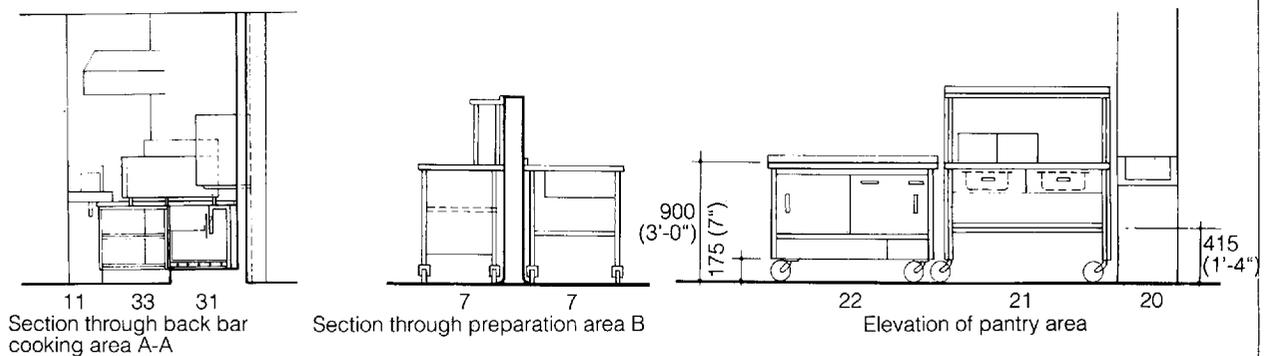
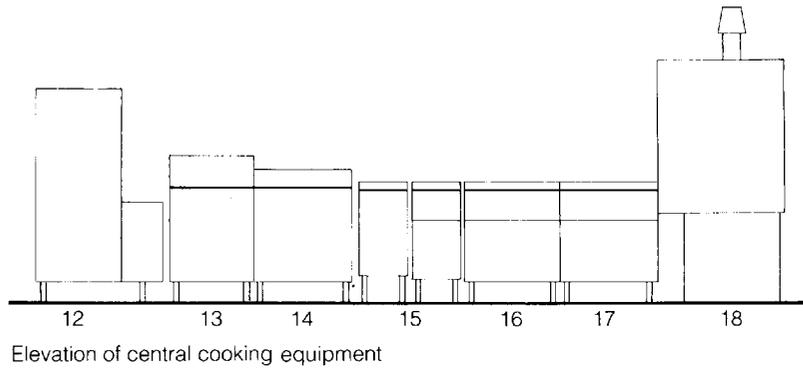
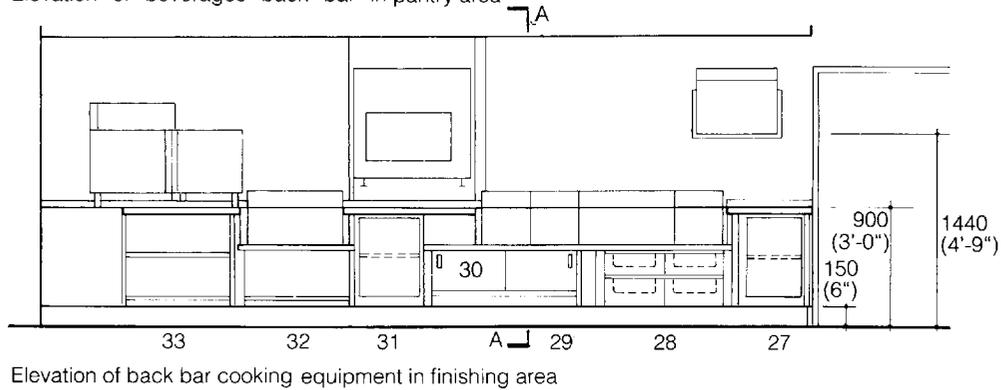
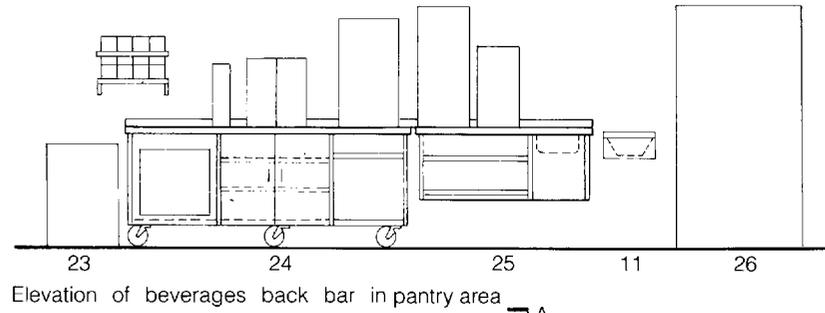
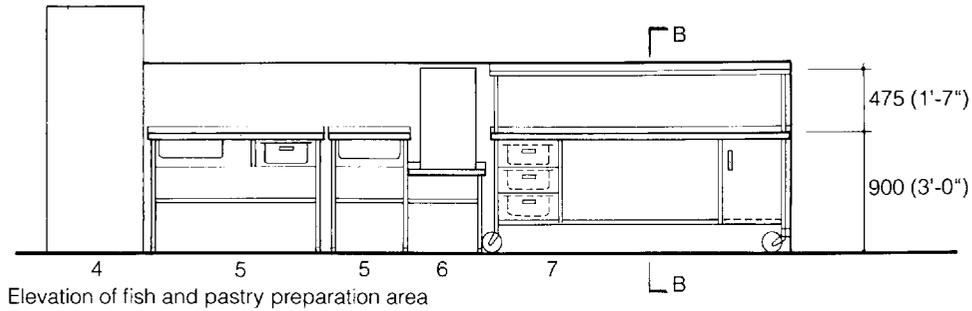
Dishwashing area

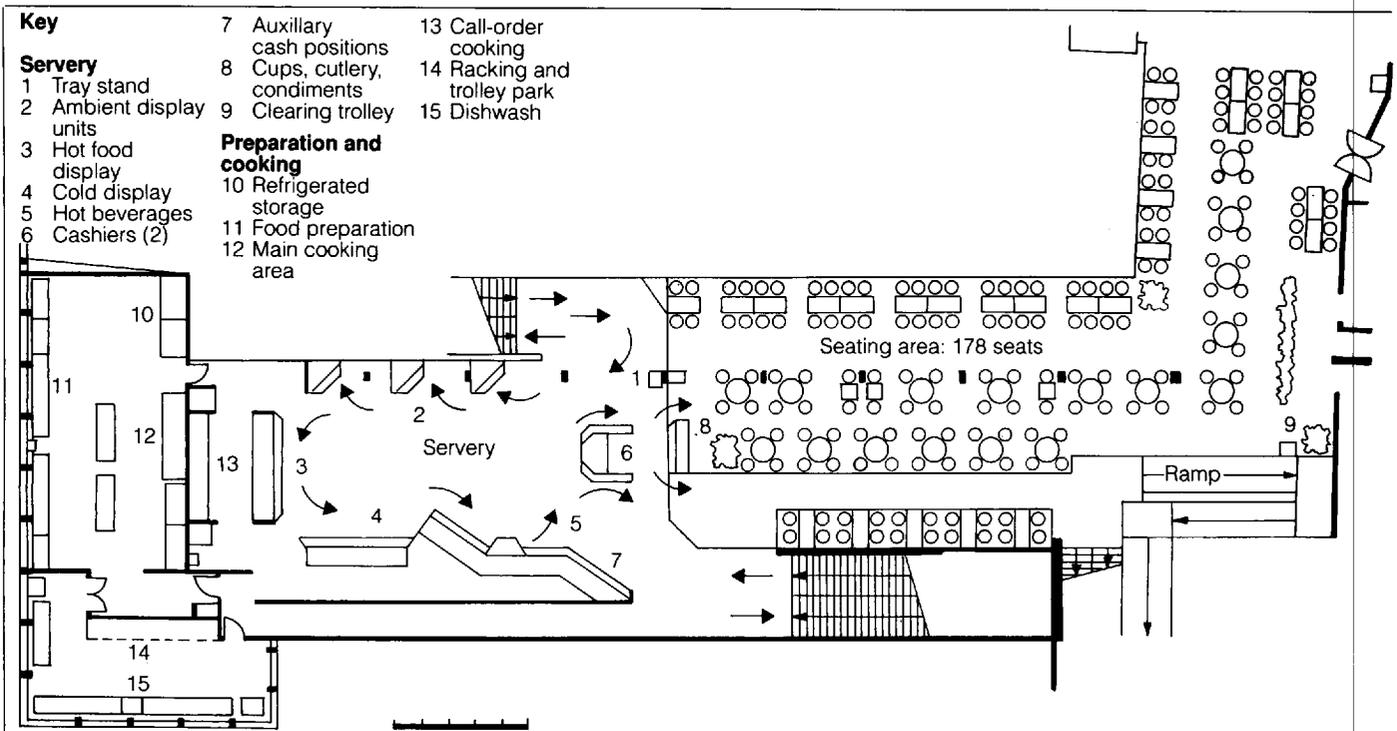
- 47 Tray rest and overshelf
- 48 Racking slide with inset waste chutes and spray sink
- 49 Dishwashing machine
- 50 Racking slide for clean dishes
- 51 Pot wash sink
- 52 Mobile storage racks

Staff vending area

- 53 Drinks vending machine
- 54 Meal vending machine
- 55 Microwave oven

(see plan for key)





Rabbies Table, Prestwick Airport

Located on a balcony above the concourse, the new self-service restaurant was designed to attract attention and provide an interesting range of local food specialities. Emphasis has been put on prominent signage and staircase design as well as in menu graphics.

Catering consultants: Tricon Foodservice Consultants Ltd
 Client: British Airports Authority

Glass enclosures

Architectural glass enclosures are normally double glazed in 4 mm tempered glass (tinted or clear) with a sealed 17 mm cavity insulated against cold bridging. Laminated glass, polycarbonate and acrylic panels may also be used. Structural framing in extruded aluminium can provide self-supporting spans of 3.65 m (12 ft) standard and up to 12 m (40 ft) to special design for superimposed snow loadings of 1.4–4.8 kN/m² (30–100 lb/ft²) and wind loads of 1.2 kN/m² (25 lb/ft²).

The examples show:

- a. Architectural glass structures used for a multi-storey atrium barrel arch entry ways and skylights. B.T.11 Restaurant, West Hartford, Ct., USA
 Architects: Callister, Gately & Bischoff,
- b. Glass enclosures integrated into the design of a restaurant, Mount Laurel, New Jersey, USA,
- c. Standard greenhouse extension for a Pizza Hut restaurant.
 Architectural glass structures by English Greenhouse.



(a)



(b)



(c)

- umbrellas or canopies,
- window boxes, planters, decorative blinds (style should be in corporate image),
- barbeques, outdoor receptions and parties.

Signs

- most conspicuous within 60° arc and up to 10° above eyeline,
- for street viewing distance 15–30 m (50–100 ft), lettering is usually at least 18 mm thick, 100 mm (4 in.) high,
- for highway viewing distance 60–100 m (200–300 ft), lettering should be 40–60 mm thick, 200–300 mm (8–12 in.) high,
- lettering for signs within premises, for reading up to 15 m distance, should normally be 9 mm thick, 50 mm (2 in.) high,
- bold lower case lettering most easily read,
- short name more easily seen and remembered,
- simple symbol with strong, clear outline conveys instant message,
- any symbol or logo must be repeated throughout design,
- the style and overall design must represent the character and level of sophistication of the establishment.

1.09 Access planning

The points of entry to the premises must be clearly identifiable, convenient, free from hazards and appropriate for the purpose. As a rule provision must be made for:

- outside customers, arriving on foot, by car, taxi or coach,
- internal customers, from other parts of the building,
- staff, with associated staff facilities,
- goods deliveries – food, drink, laundry, equipment, servicing,
- refuse and garbage – storage and collection.

1.10 Car parking

Car parking requirements will vary with the type of premises, its location and the local planning authority standards. The installation of a car park – obtaining land, clearance, construction, drainage, marking out and lighting – is expensive. For an out-of-town restaurant, car parking typically occupies 2–3 times the built area of the premises.

Basic parking dimensions	Europe	USA
Standard parking bay or typical stall	4.2 × 2.4 m	19 × 9 ft
— for larger cars	5.8 × 2.8 m	
Areas per car including:		
— clear aisles for manoeuvring	19–23 m ²	290–350 ft ²
— access and screening (overall site area)	25–30 m ²	350–400 ft ²
Car spaces: typical provision	Rural	Urban(a)
Restaurant: diners	1/2 seats	1/5–10 seats
Bar: public	1/4 m ²	–
Club: patrons	1/2 seats 1/4 m ²	1/5–10 seats –
Hotel: residents	1/guest-room	1/2–4 rooms
Conference or function: diners	1/4 seats	1/10 seats
Staff: residential	1/1 family	–
Staff: non-residential	1/3 employees at peak period	

(a) Depends on taxi services, market orientation and grade of restaurant or hotel. Public, allocated or shared parking may be used.

1.11 Food and service deliveries

Access to the premises for food deliveries, maintenance and garbage collection must be separate from access for customers. Details are given in Chapter 8, sections 2.03–2.05.

1.12 Staff entrances

Requirements for staff entrances depend on the size and nature of the establishment. In hotels, institutions and places of entertainment a separate staff entrance is usually necessary with supervision control, time recording equipment and other employee facilities (changing-rooms, lockers, toilet and washing facilities, rest-rooms) to comply with legal requirements.

1.13 Main entrance

The main entrance must be clearly defined and, if possible, provide a reassuring view of the interior. The design of the entrance doorway and surrounds should represent the type of establishment as well as satisfy functional requirements.

Key requirements include:

- *width*: must be in proportion to frontage and amount of use. Fire escape requirements apply. Typically 840 mm (33 in.)–914 mm (36 in.) single, up to 1500 mm (60 in.) double for large fast-food

units and hotels,

- *swing*: double swing doors preferable but these must be recessed within the building line,
- *construction/security*: toughened glass, or glass panelled. An outer solid door or inner metal screen may be provided for additional security. Dual locking system installed,
- *style*: the door or handles may display the company logo. For high-class restaurants a more traditional design is often used,
- *durability*: resistance to impact, scuffing and weather is essential. The design may incorporate protective panels,
- *draughts*: air-conditioning or convection heating may be installed as air curtain. A draught lobby may also be used,
- *shelter*: the door should be recessed or a canopy provided. A recessed area of 2 m² (20 ft²) is the minimum for 2–4 people,
- *information*: the menu may be displayed in a glass panelled case or in the window. For fast-food and popular catering pictorial displays have greater impact.

1.14 Means of escape in event of fire

Staircases, corridors and doors are also used as means of escape and must comply with safety requirements (location, design, construction, protection, linings). Details are given in Chapter 6, section 7.07.

2. Circulation

2.01 Flow patterns

The flow patterns of customer arrivals and departures and the demands likely to be placed on the restaurant, bar and other facilities are determined by evaluating market data and applying the experience of similar operations elsewhere. As a rule the most important considerations are:

- overall numbers per day, arrival patterns and grouping of customers with range of variations for weekday/weekend and seasonally (determines sales potential, optimum size and staffing requirements, feasibility),
- peak demands, concentrated arrival rates, times of day, duration (affects circulation planning, service and production requirements, staff

rostering),

- superimposed requirements for special parties, take-away sales, possible changes in style of operation (breakfast, midday, evening).

2.02 Circulation planning

Analysis of the probable movements of customers and staff is essential in order to determine the optimum layout. Circulation planning should aim to ensure:

- the required facilities are in appropriate places,
 - movements are planned and rationalised,
 - space, facilities and employees are used most effectively,
 - delay, crowding and congestion are controlled,
 - disturbance to other customers is minimised.
- This applies in planning both customers' needs and the production of food. (See Chapter 8.)

2.03 Theoretical solutions: simulation models

Simulation techniques are used to determine the effects of different arrival patterns (numbers, groups, time intervals) and of changes in the intervals of time required for each phase of the operation (ordering, preparing, serving, consuming, charging). Simulation provides numerical solutions to questions of space and time, such as:

- equipment and staff utilisation,
- potential delays, queues,
- seat occupancies and turnover rates,
- optimum seating arrangements,
- revenue generation levels.

Methods applied in simulating conditions include simple tabulation, digital programs (to represent flows of people), analog programs (for continuous flows of energy and other services) and graphical representation.

2.04 Changes in operation

Alternative proposals may need to be evaluated in order to assess their feasibility. This applies particularly where existing arrangements are to be improved, a new image or style of operation introduced and/or in developing new marketing opportunities.

<i>Options</i>	<i>Potential benefits</i>	<i>Consequences</i>
Rationalisation of menu	Savings in labour, equipment, time. Increased efficiency	Changes in market orientation, company policy implications
Improvements in service and choice	Fewer delays; improved space utilisation and turnover	Higher costs of equipment and employment
Provision of separate bar/coffee lounge	Pre-ordering; greater use of restaurant; increased sales	Conversion of space, services and equipment. Operating costs

2.05 Circulation to the dining area

Access to the dining area may be:

- directly from the street or public concourse,
- through a passage or stairway,
- through an antespace with adjacent cloak-room and toilet facilities,
- through a reception area with lounge and bar service,
- through a service hall for collection of food.

2.06 Circulation within the restaurant

Provisions for guiding the circulation of customers within the restaurant will depend on the style of service. In an expensive restaurant customers will probably be received and taken to their seats by the receptionist or head waiter. In other cases customer movement must be accommodated by:

- providing clear aisles from the entrance of the restaurant,

- placing visual or physical barriers to regulate movement (barrier rails, screens, floral displays),
- siting tray, cutlery and condiment dispensing stands to draw attention (with space for use). All barriers must be sufficiently high and conspicuous enough to be easily noticeable in a crowded room. They should not obscure views and should be easily moved to suit particular occasions.

2.07 Self-service counters

The approach to the counter must be straight and clearly identified:

- menu choice and prices must be clearly indicated:
- Fixed price – at the entrance,
- Cafeteria – at the entrance and over or behind each section,
- photographic representation assists in merchandising,

Access	Typical situations	Planning considerations
Direct	Direct street frontage High value location (high street, shopping mall) Space at a premium	Window design and interior view are important aspects of merchandising Maximum revenue earning space or high volume sales essential Food production rationalised Ancillary facilities located to rear or on another floor
Stairway	Basement restaurant or first-floor restaurant	Staircase and entrance designed as features of interest Pitch preferably 27° or lower Fire regulations apply (see section 1.14) Menu displayed at entrance with photographic views of interior
Antespace	Hotel coffee shops Individual restaurants	Direct access from lobby and street Distinctive style and graphics essential to identify character
Lounge	Hotel restaurants Night clubs Leisure dining	Cocktail bar visible in adjacent area Lounge space may be part of circulation Decor and lighting graded to focus attention Separate high quality toilets and cloakrooms required
Service hall/food court	Self-service restaurants in major stores, airports, railway stations and motorway service areas Large scale employee and institutional feeding Fast-food counters	Routes through service hall planned for convenient circulation without crossing or congestion Counters arranged in logical sequence and clearly indicated with promotional displays Multiple cash desks provided for peak flows Restaurant adjacent and on same level, with a separate exit Secondary area may be provided for takeaway meals Service hall may require 25–30 per cent of restaurant space. High turnover required Service counters prominently positioned facing the entrance, direct from the street Designed for high volume sales with large, clear circulation space Restaurant seating arranged to one side and in supplementary areas on other floors



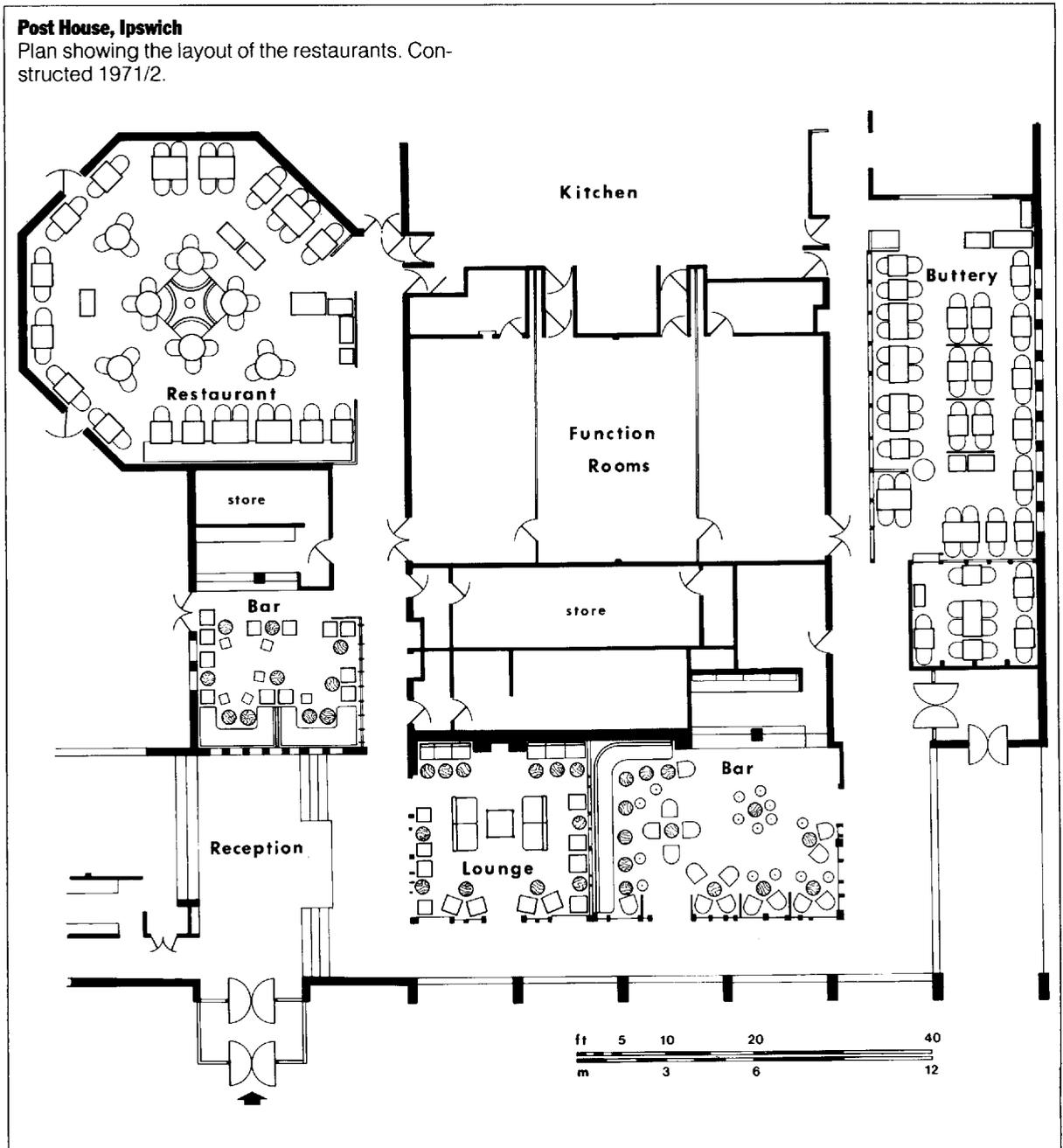
(a)

Waverley Market, Edinburgh

Waverley Market is a retail centre of 50 small, high grade shops, the gross retail area being 3,000 m² and net lettable area 6,500 m². The development was completed in July 1984 at a cost of £9 million. Retail units are arranged on two floors linked by two atriums, one of which is used as a food court with eight catering units grouped around a poolside café area (a). Extensive use has been made of mirrors to add animation and spaciousness.

Architects and designers: Building Design Partnership
Clients: City of Edinburgh District Council with Reed International





use, i.e. the main meal period.

In any particular premises the area per seat will also depend on the type of operation and standards provided. This can be illustrated by the following examples which show the range of variation:

Seating arrangements are discussed in the following sections and further information on more specific requirements for food production is given in Chapter 8, with examples of restaurants in Chapter 10.

4. Seating requirements

4.01 Seating and table arrangements

There are usually significant differences in the arrangement of seating areas, depending on:

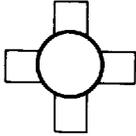
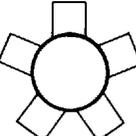
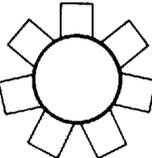
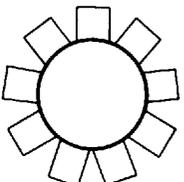
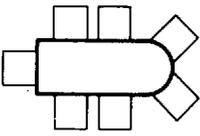
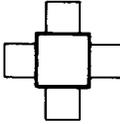
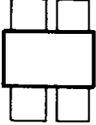
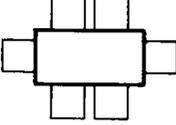
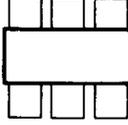
- customer profiles – average spend nature of meal, expectations,
- circumstances – leisure dining, basic meal, refreshment,
- table service – self-service, waited service, counter seating,
- grouping – table sharing, flexibility in arrangement,
- room characteristics – dimensions, windows, obstructions.

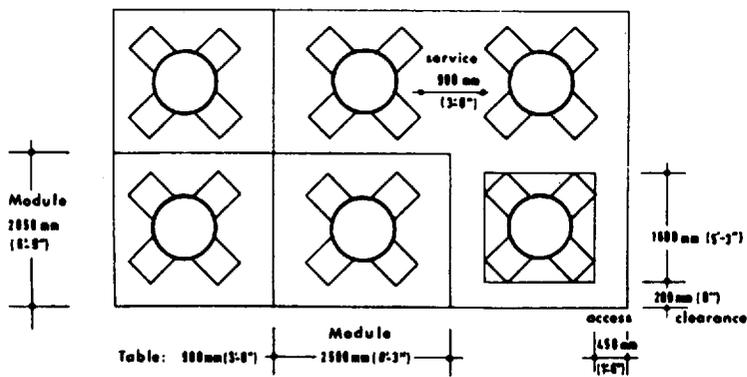
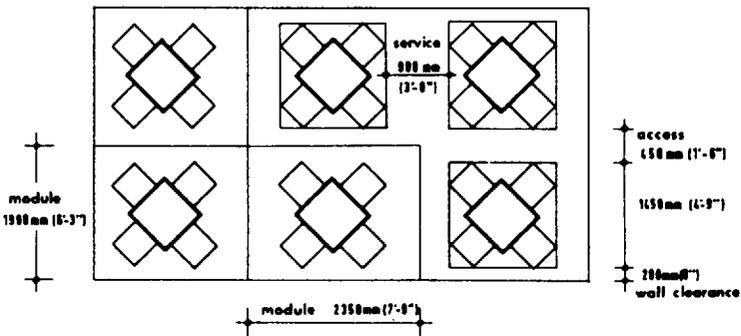
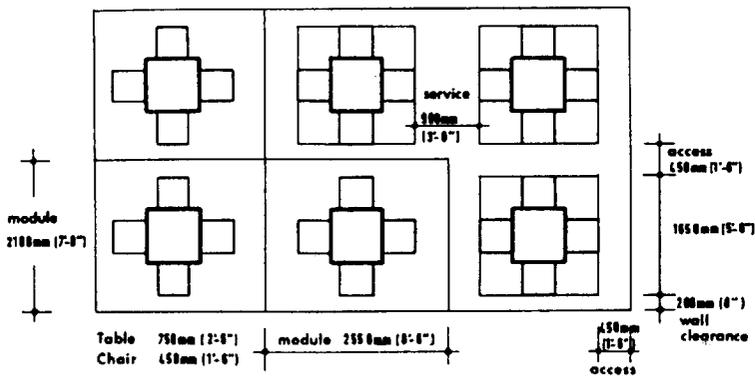
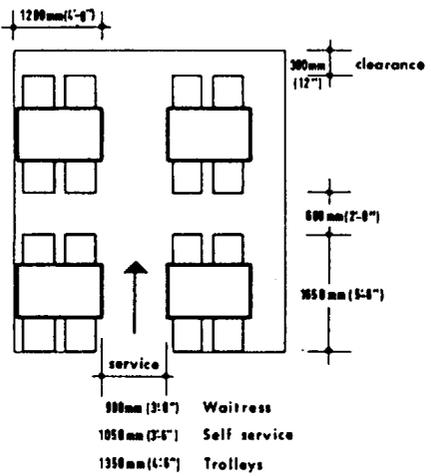
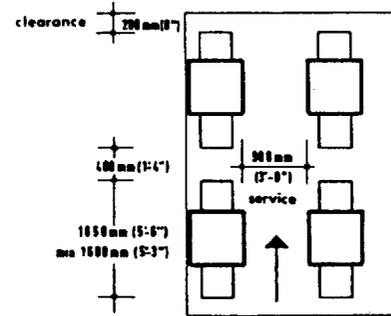
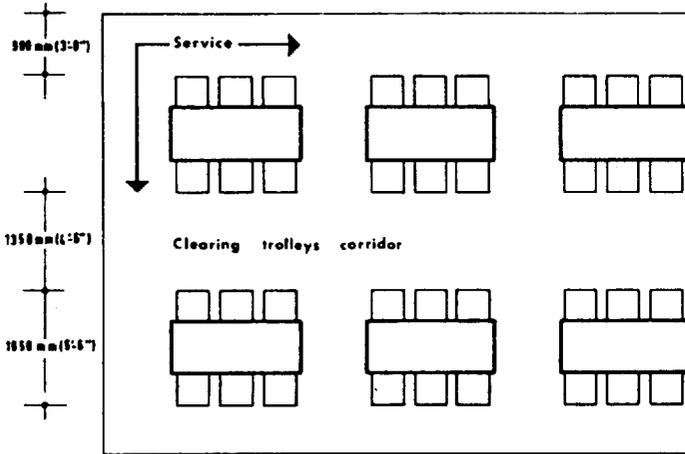
The range of seating capacities, based on average requirements, is indicated below.

Type of seating and service	Area per diner	
	m ²	ft ²
Table service		
Square tables in rows:		
parallel seating 2	1.7–2.0	18–22
parallel seating 4	1.3–1.7	14–18
diagonal seating 4(a)	1.0–1.2	11–13
Rectangular tables in rows:		
seating 4	1.3–1.5	13–16
seating 6	1.0–1.3	11–14
Circular tables in rows:		
seating 4(a)	0.9–1.4	10–15
Fixed banquette seating		
In booths seating 4		
waitress service	0.7–1.0	8–11
including counter for self-service	0.9–1.4	10–15
Counter seating		
Tunnel counters	1.4–1.6	15–17
Single counters	1.7–2.0	18–22
Single counters used with wall units	1.1–1.4	12–15
Banquet groupings		
Multiple rows	0.9–1.1	10–12
Single row	1.0–1.3	11–14
Self-service (trolley clearance)		
Rectangular tables in rows:		
dining area only		
seating 4	1.4–1.6	15–17
seating 8	1.1–1.3	12–14
seating 8	1.0–1.2	11–13
including counter service		
seating 4	1.7–2.0	18–21
seating 6	1.3–1.8	14–19
seating 8	1.2–1.6	13–17
Self-service (self-clearance)		
Rectangular tables in rows:		
dining area only		
seating 4	1.3–1.5	14–16
seating 6	1.0–1.2	11–13
seating 8	0.9–1.1	10–12
including counter area		
seating 4	1.5–1.9	16–20
seating 6	1.2–1.6	13–17
seating 8	1.1–1.5	12–16

(a) Economy in space is obtained with tables at 45°.

Table seating arrangements and limiting dimensions including spaces for access and service.

	Dining area	Lounge area
	TABLE DIAMETERS 900-1000mm (3'-0"-3'-3") 3 or 4 chairs	4 or 5 chairs
	1050 mm (3'-6") 4 or 5 chairs	5 or 6 chairs
	1200 mm (4'-0") 6 or 7 chairs	7 or 8 chairs
	1500 mm (5'-0") 8 or 9 chairs	9 or 10 chairs
	750 mm diam. (2'-6") semicircle increases chair seating by 1	
	750 x 750 mm (2'-6" x 2'-6") min. 700 x 700mm (2'-3" x 2'-3")	700 x 700mm (2'-3" x 2'-3")
	min. 750x750mm	750 x 750 mm (2'-6" x 2'-6") min 700 x 700mm (2'-3" x 2'-3")
	1200x750 mm (4'-0" x 2'-6")	1200 x 750 mm (4'-0" x 2'-6") min. 1200x700mm (4'-0" x 2'-3")
	1500x750 mm (5'-0" x 2'-6")	1500 x 750mm (5'-0" x 2'-6")
	1800 x 750mm (6'-0" x 2'-6")	1800 x 750mm (6'-0" x 2'-6")



4.02 Room characteristics

Particulars to be considered:

Room details	Considerations
Dimensions and shape of room	Dimensions for seating modules, space for aisles, tentative layouts
Obstructions	Incorporated into seating plan as a practical or decorative feature
Main and service entrances	Circulation patterns, optimum positions for counters, stations, cashier points
Windows, views	Arrangement to provide best benefit
Steps, changes in level	Potential hazards, possibly designed as feature (raised balcony)
Perimeter	Possibility of extension (alcoves) and divisions within room (landscaping)
Equality of treatment	Compensatory features for disadvantaged seating positions (space, individual design features, screening)

4.03 Service requirements

Self-service

As a rule the tables and chairs need to be in orderly lines with wide aisles which allow easy circulation. Seating plans are usually in parallel rows or booths but diagonal and indented layouts add interest and variety.

The plan must provide for information, self-service and self-help facilities (tray, utensil and condiment stands) as part of the overall design.

Waited service

A more flexible arrangement is possible with greater variety in table sizes and shapes and in the types of seating or chairs used. Key requirements include:

- circulations of customers and serving staff must not cross where the flows are concentrated (near entrances, serving stations, dispense bars),
- inflow and outflow routes for service must both be planned to avoid congestion, accidents and disturbance,
- service stations, sideboards, trolley parks, cash desks, and counters must be positioned to allow screening and adequate space (for use and circulation).

Counter service

Counters generally take up more space than tables since seating is only on one side. To

increase space capacity:

- counters may be extended into loops around service corridors,
- supplementary table or side counter seating may be provided.

Counter seating is used:

- for cocktail bars, wine bars, taverns, inns and pubs, etc, to allow seating, standing and congregating around a focal point,
- for snack bars, sandwich bars, sashimi and sushi counters, steak bars, etc, where food is prepared to order at or behind the counter in view of the customer.

4.04 Types of furniture

Restaurant furniture falls broadly into four main types:

- fitted counters or bars, with working and serving surfaces,
- fixed tables, usually with pedestal or cantilevered support,
- movable tables, with legs or pedestal support,
- stackable tables, with folding or detachable legs.

In each case the related seats, chairs or counter stools may also be:

- fixed in place, with cantilevered or pedestal support,
- fitted, as banquette, bench or booth seating,
- movable, with legs or pedestals,
- stackable, in columns or collapsible.

4.05 Counter design

In determining the optimum dimensions for counters and counter stools reference must be made to representative body measurements of the intended users (anthropometric data) and the work related operations involved in preparing and serving food and drink and in using the counters (ergonomics).

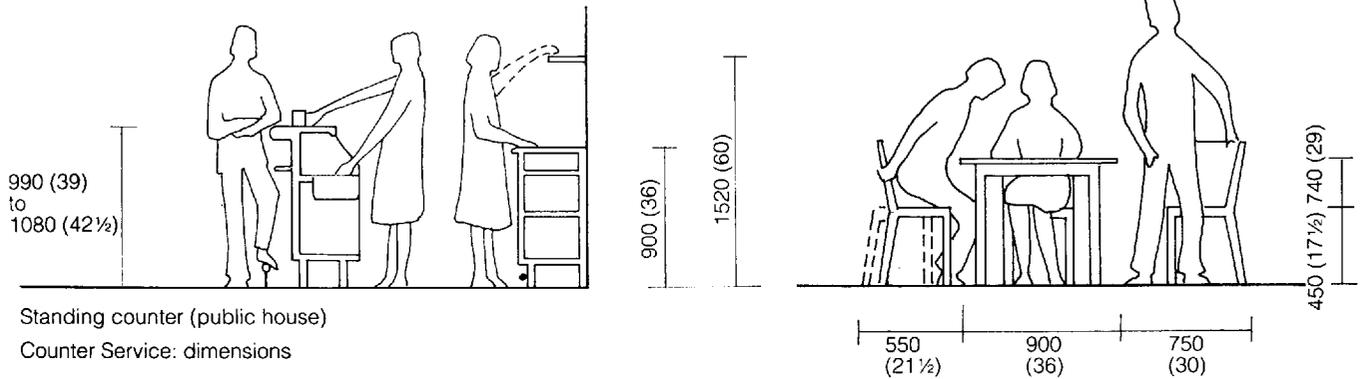
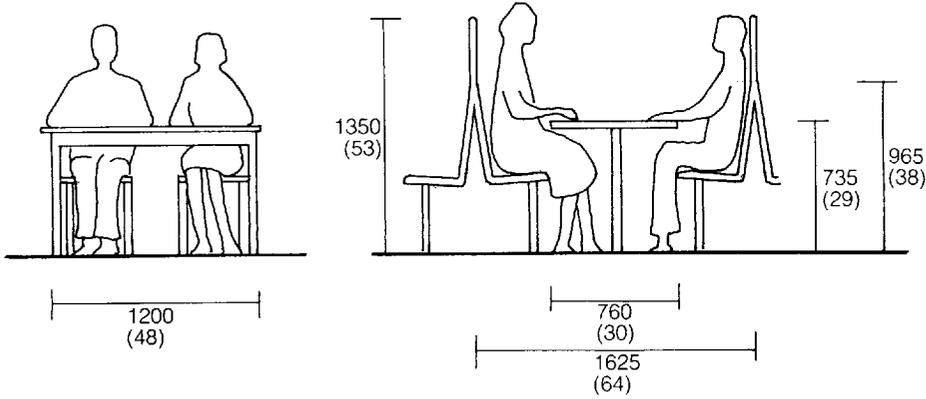
The main dimensions are dictated by the:

- average height and forward reach of staff serving behind the counter,
- counter space needed for displaying, preparing and serving food and for customer eating and drinking space,
- convenient height for customers seated (or standing) at the counter end,
- space and provision for comfortable seating and support, access and use.

Design requirements may be summarised:

- *working height*: elbow level, for a woman of average height, 900 mm (36 in.); for reaching forward less strain if higher; front section up to 1080 mm (42½ in.),
- *options*: two levels – higher front section for service – lower rear section for working intermediate – about 970 mm (38 in.),

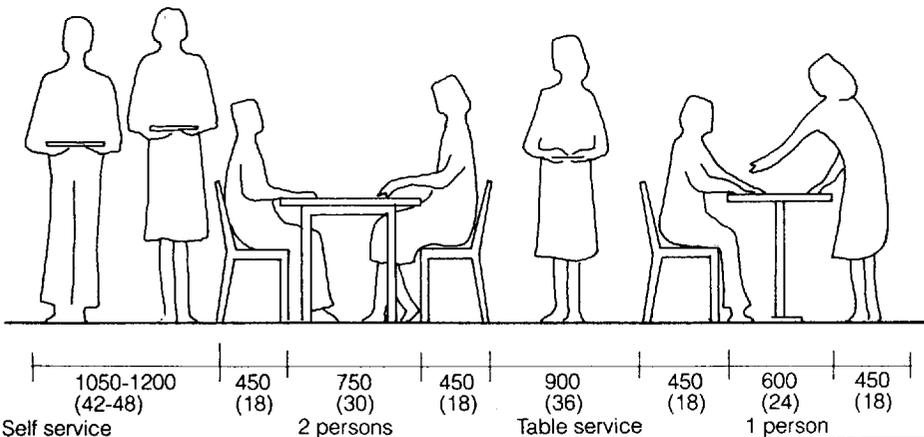
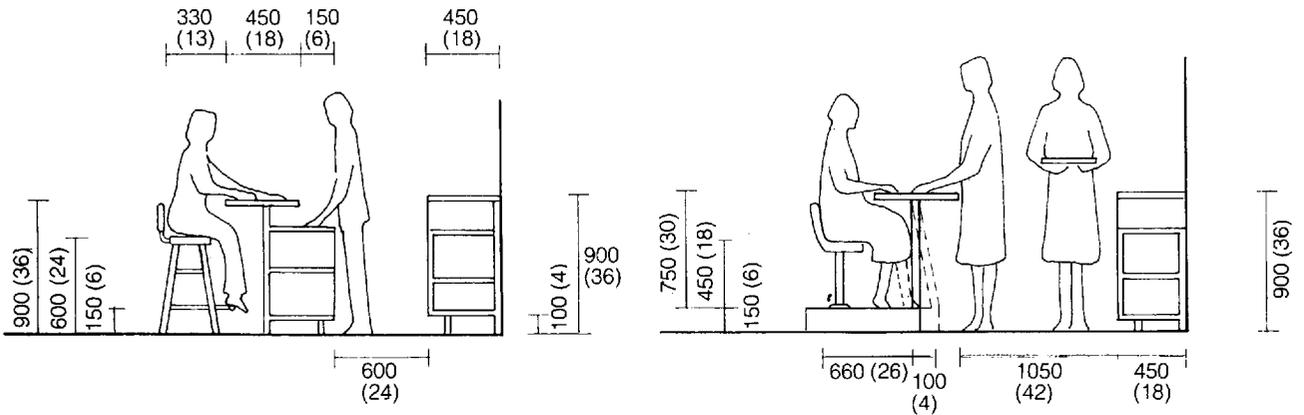
Typical counter service dimensions mm (in.)



Standing counter (public house)

Counter Service: dimensions

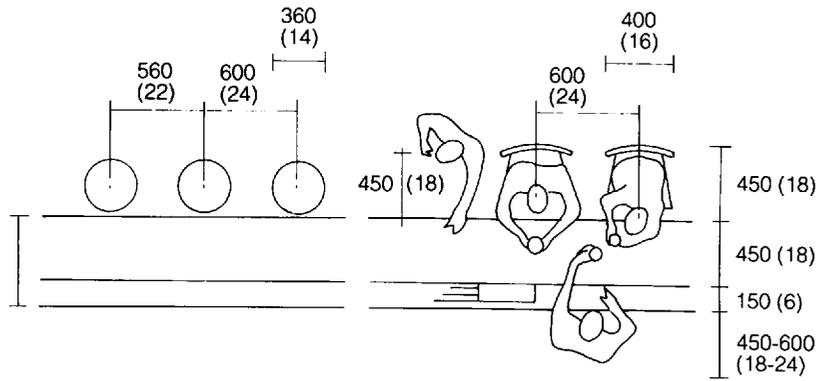
for 4 persons



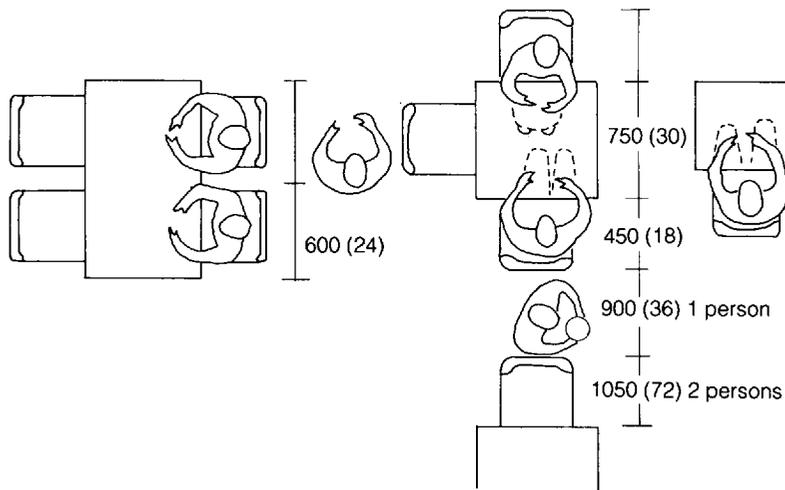
Self service 2 persons Table service 1 person

Counter seating

mm (in.)



access



Dimensions for various tables and local seating densities.

- *reach*: max. 600–700 mm (24–27 in.), width of counter
- *knee space*: min. 230–300 mm (9–12 in.); counter recess or overhang,
- *counter stools*: thigh thickness 230 mm (9 in.); clearance between seat and overhang,
- *height difference*: counter top and stool 280–300 mm (11–12 in.); typical, allowing for counter design,
- *stool height*: length of lower leg about 460 mm (18 in.); if foot support rail or step provided. Increase to max. height 800 mm (31 in.)
- *width/person*: allowing for elbow room, 600 mm (24 in.); if restricted, may be reduced to 550 mm (22 in.),
- *stool width*: normally limited to about 360 mm (14 in.) for easy access.

5.Cloakrooms and ancillary facilities

5.01 Customer toilet and cloakroom facilities

Requirements for sanitary accommodation are mainly governed by legal provisions as represented by the following statutes:

table 5.01		
<i>Situation</i>	<i>Examples of provisions</i>	<i>Statute</i>
Refreshment houses – for sale of food or drink	Adequate number of conveniences for persons using the premises	Public Health Act 1936, Section 89
Licensed premises – for sale of alcoholic drink	Adequate and suitable conveniences, separate for men and women	Licensing Acts: condition for issue of licences
Employee facilities (a)	Suitable and sufficient conveniences, washing and changing facilities	Offices Shops and Railway Premises Act
Food premises (b)	Separation of conveniences Provision of washing facilities	Food Hygiene (General) Regulations

(a) In industrial and food manufacturing premises, employee facilities are governed by the Safety at Work Act and Regulations.
 (b) This is also a condition for registration of premises used for processing and preservation, etc., of food.
 General requirements for sanitation and drainage are included in Public Health Acts and Building Regulations.
 Guidelines on the standards of provision are provided in the Regulations and by British Standard Code of Practice CP3, Chapter 3, 1950.

table 5.02					
<i>Appliances</i>		<i>For male customers(a)</i>		<i>For female customers(a)</i>	
WCs		1/100		2/100(b)	
Urinals		1/25(b)			
Washbasins		1/WC plus 1/5 urinals(b)		1/WC(b)	
<i>Typical areas(c)</i>		<i>m²</i>	<i>ft²</i>	<i>m²</i>	<i>ft²</i>
Good standard	Minimum				
up to 70 seats	up to 100 seats	7.0	75	7.5	80
up to 130 seats	up to 200 seats	10.0	108	11.0	118

(a) Based on Technical Regulations for Places of Public Entertainment in the Greater London area.
 (b) For higher standards the numbers of appliances should be increased to 1 for 1–15 customers, 2 for 16–35, 3 for 36–65, 4 for 66–100 customers and 3 per cent above 100.
 (c) Areas increase in steps with additional appliances and allow for screening and intervening ventilated spaces.
 Standards depend on Local Authority requirements. The minimum is based on half male, half female customers. This ratio will depend on the market orientation of the restaurant. Good standards usually allow for up to two-thirds male, or two-thirds female customers or the higher numbers of appliances in (a). For the ambulant disabled a specially fitted cubicle may be provided, increasing these areas by about 2.0m².

5.02 Customer toilet and cloakroom facilities

For small premises with up to fifty seats the minimum provisions are:

<i>Customer use</i>	<i>Facilities</i>	<i>Minimum area</i>	
		<i>m²</i>	<i>ft²</i>
Male	WC with washbasin	3.0	32
Female	WC with washbasin	3.0	32

Allowing for screening and separate intervening space.

In larger establishments the recommended minimum standards(a) based on the maximum numbers of seated customers at peak periods are:

5.03 Construction and services

Toilet facilities should be easily accessible, with suitable signage, and be positioned to allow economical drainage and ventilation. Separate facilities must be provided for male and female customers; they should not be used by employees. The main constructional requirements may be summarised:

Constructional features	Typical requirements
Floors	Impermeable, resistant to staining or damage Laid to falls with gully outlet. Typical materials: ceramic tiles, composition tiles
Walls – up to 1400 mm (52 in.) high	Similar requirements to resist damage. Materials: ceramic wall tiles, preformed plastic laminate
Upper walls and ceiling	Decorated plaster with some sound absorption Inert to moisture. Flush or recessed luminaires
Partitions	Preformed laminates. About 150 mm (6 in.) clear of floor, 1900 mm (75 in.) high (unless separately ventilated) Shelves and coat hooks provided
Entrance door	Sound insulating and close fitting with self-closure device. Interior of water closet or urinal space screened from external view
Fittings	Commercial quality fittings, preferably cantilevered or corbelled out to allow easy floor cleaning Compact layout usually necessary
Lighting	100 lux (9 lumens/ft ²) in toilet area. May be graded in antespace. Screened over mirrors
Ventilation	Mechanical extraction to give 6 air changes/hr (minimum 3) with balanced inflow. Natural ventilation openings at least 1/20 floor area.
Intervening space	A separately ventilated space must be provided between any closet or urinal and the food rooms. This may be a passage or anteroom (powder room, washroom or cloakroom)
Cloakroom	Adjacent to toilets. Average area 0.05 m ² (0.5 ft ²) per user.

5.04 Employee requirements

Traditional methods of food production and service involve a high degree of skill which, to some extent, can be offset by rationalising and simplifying the work. Difficulties in recruiting labour may arise from a general shortage of trained personnel, competition for labour in the area, the irregular pattern of work which often involves shift work or part-time jobs, and the general attitude towards service employment.

The type of labour required for any particular operation will depend on:

Conditions affecting employment	Planning considerations
Range and sophistication of menu and service	Full or limited menu. Range of choice. Table service, counter or cafeteria service
Extent of food preparation on the premises	Type of equipment and operative skills. Systems of production
Meal times covered, seat turnover, days open	Extent of shift work including split-shifts. Work scheduling and efficiency of labour utilisation

Depending on the type of restaurant, payroll costs usually amount to between 20 and 34 per cent of total income and even a small percentage increase can affect the feasibility of investment.

In structuring labour requirements, it is necessary to apply a number of principles:

— *labour costs*: overall costs will need to be vigorously controlled within narrow margins, particularly for price-competitive products such as fast foods,

— *rationalisation*: to reduce dependence on skill, system-based methods may be used relying more on equipment performance,

— *job specification*: the nature and extent of work involved in food preparation and service must be analysed and individual job requirements specified in detail,

— *work schedules*: details of the work, including variations in work loads, must be examined and duty rosters prepared to ensure employees can cope efficiently with the demand at any time, including peak periods,

— *flexibility*: to cover different meal times it is usually necessary to split shifts of duty or to use a high proportion of part-time labour,

— *interchanging roles*: traditional methods of food production and service require a high degree of skill and work demarcation. The trend, however, is towards more on-the-job training and allocation of work to suit changing requirements.

5.05 Employee ratios

In view of the wide variations of labour requirements in different establishments, it is difficult to make general comparisons. The following ratios provide a very broad indication of requirements.

Seats: employee

In Great Britain the average for commercial restaurants is about 7.6 seats per employee,

including part-time staff. For individual restaurants the range is from 6.0 to 8.0 depending on the menu range, standard of personal service and on intensity of seat turnover. In the United States the average ratio is 5.1 seats per full-time equivalent employee, which is broadly comparable with the British average.

Meals sold: employee

There is a wide variation in sales depending on the type and cost of meals and on the seat turnover. In Great Britain the weekly average number of meals sold per employee is about 113, but this ranges from 62 to 81 for full menu table service restaurants to 151 for limited menu table service and 234 for fast-food units. Similar variations apply in the United States, with an overall weekly average of 137 meals sold per full-time equivalent employee.

Meals: labour hour

For fast-food or multiple operations in which a large number of part-time staff are employed, the sales output may range from 6 to 9 meals or more per labour hour.

Similar ratios may be used in institutional and welfare services, such as in school meals, where costs may be allocated, for example, on the basis of 8.8 to 9.8 meals per labour hour depending on the type of school and numbers involved.

Sales per employee: payroll costs

This ratio is expressed as the productivity index and provides a direct comparison with other commercial operations as well as a target for sales outputs. For most commercial restaurants in the United States selling only food, the Index of Productivity is around 2.98 (cafeterias) 3.06 (coffee shops) 3.11 (full menu with table services) 3.16 (limited menu with table service) and 4.28 (fast-food units).

In establishments selling food and alcoholic drinks the Index of Productivity increases to an average of 3.19 for restaurants providing a full menu with table service and 3.49 for a limited menu with table service.

5.06 Peak numbers of employees

For the purposes of assessing employee facility requirements the maximum number of people working at any one time is more significant than the numbers employed in smaller shifts. The following table represents the average number of staff expressed in ratio to the number of meals served during the main meal period of the day. Individual restaurants will show wide variations.

<i>Type of premises</i>	<i>Approximate ratio employees: meals served over main meal period (range)</i>
<i>Employee feeding</i>	
Food production (preparing, cooking and assembling meals and cleaning kitchen)	1:40
Main cafeteria service with part table service to dining room, clearing and dishwashing	1:40
TOTAL EMPLOYEES	1:20
<i>Full menu restaurants (with table service)</i>	
Food production (preparing cooking and serving food and dishwashing)	1:20 (1:10–1:30)
Waiter/waitress service (seat turnover during meal period – 2.0)	1:14 (1:8–1:20)
TOTAL EMPLOYEES	1:8 (1:7–1:9)
<i>Limited menu restaurants (with table service)</i>	
Food production (including dishwashing)	1:40 (1:30–1:50)
Counter and waitress/waiter service (seat turnover during meal period – 3.0)	1:30 (1:24–1:36)
TOTAL EMPLOYEES	1:20 (1:18–1:24)
<i>Fast-food operations (no table service)</i>	
Food production and counter service including table clearing	
TOTAL EMPLOYEES	1:33 (1:30–1:40)

5

Interior Design

1. Approach to interior design

1.01 Options

Interior design services may be provided in various ways.

<i>Design role</i>	<i>Typical services</i>
As part of the architectural brief	Integrated with other services. Specialist design services may be included or nominated
Appointment of interior designer	For developing new concepts, corporate styles, interior refurbishment schemes
Contracted design and supply services	Custom design services or standard product range for furnishings, fittings and furniture
Turnkey projects	Inclusive design and build services to standard packages or customer requirements

The range of services and coverage may vary widely and each arrangement must be subject to a contractual agreement. Apart from assurances regarding the quality of the proposed work in most restaurant or bar conversion schemes, time and overall cost are critical factors in ensuring commercial feasibility. Limitations may also need to be imposed on the times for access or working, on storage of materials and on security.

Key considerations include:

- reputation, resources and experience of similar work including examples of completed projects,
- coverage of services, client approval of work, conditions of contract and means of enforcement (see section 2.05),
- overall costs, cost determination, methods of payment,
- programme and time scales for completion (see section 2.06),
- warranties, liability for defects and insurance.

1.02 Briefing

The instructions or brief provided for the architect or designer must be specific. Particular constraints and conditions must be indicated and incorporated in the contract. Design guidelines will depend on the company objectives, strategy and stage of development.

<i>Type of operation</i>	<i>Examples of design guidelines</i>
Individual premises	Scope for wide interpretation to meet defined objectives, seating capacity and budget
New chain operations	Specific objectives: concept clearly defined Detailed design to create corporate identity including graphics and styling Suitable for adaptation to other situations Full specifications of furnishings and equipment
Existing chain organisations	Design restricted by standardisation within group (equipment, style, mode of operation) Adapted to suit spatial and physical constraints of premises
Franchised units	Highly standardised. Equipment and furnishings usually specified. Suppliers may be nominated

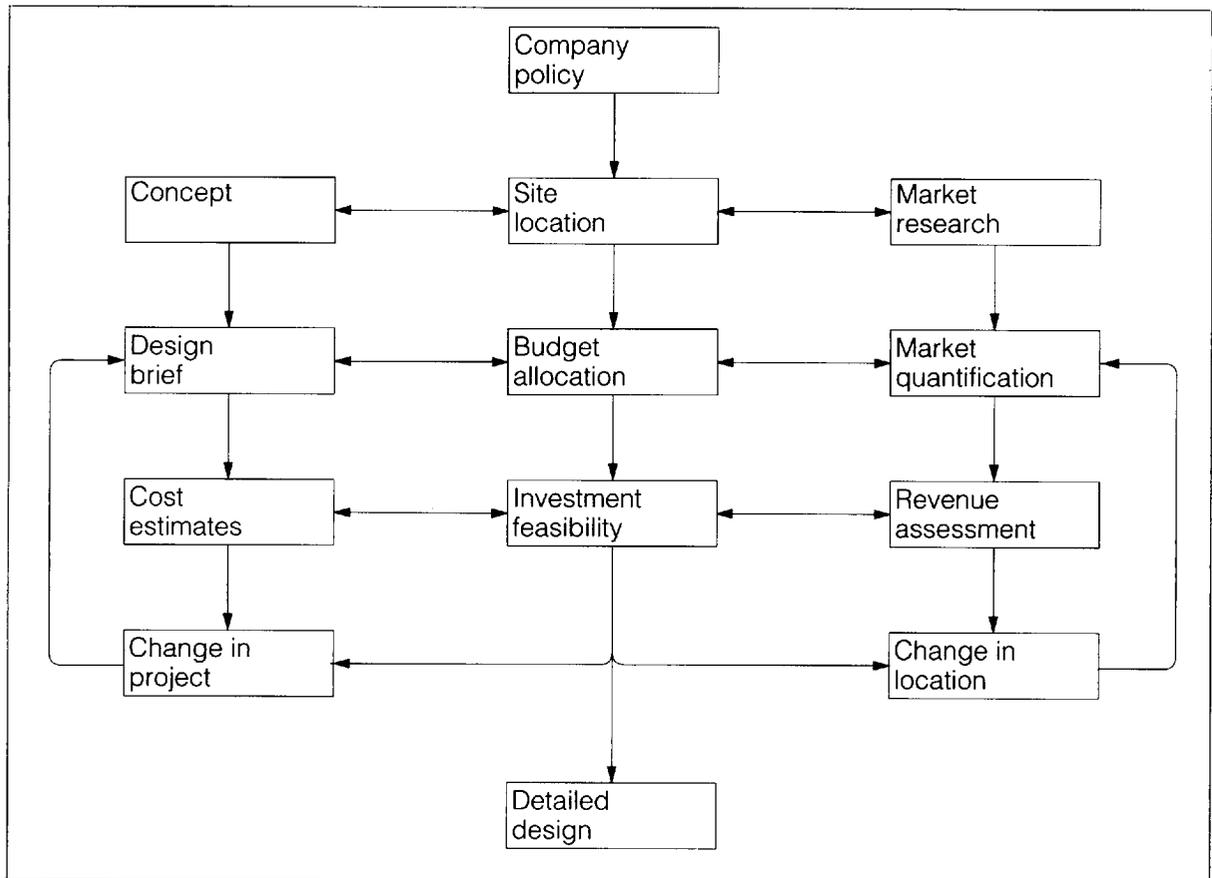
1.03 Design framework

Design should not be considered in isolation. The client (company or individual) must formulate specific objectives and a policy which will ensure that the development can be coordinated with other requirements (finance, staff recruitment and training, promotion), as:

Company policy	Product style, specific requirements Strategy for development
Concept	Objectives Market orientation
Location	Type of premises, surroundings Constraints
Function	Use of space, seating capacity Operational needs
Aesthetics	Style, character, emphasis Design features
Budget	Investment criteria Financing arrangements
Business cycle	Planned life cycle Future changes, flexibility
Programme	Critical dates, stages Contracting arrangements

1.04 Interrelationships: development model

A simplified model is illustrated below and this is developed further in Chapter 13.



1.05 Design concept

Design involves planning, selecting and organising for a specific purpose. In the case of restaurants, bars and club facilities, these requirements may be grouped under three headings:

Purpose	Design requirements
Marketing	To appeal to identified target markets by projecting the desired image (merchandising) and providing acceptable price and quality
Ambience	To create an aesthetically pleasing environment and conditions which encourage a suitable social atmosphere complementary to the style of service
Operation	To meet practical requirements for efficient operation and maintenance of standards

Marketing and behavioural aspects are examined in Chapter 3 and operational requirements in Chapters 4, 8 and 9, with more specific applications in Chapter 9.

1.06 Variations in circumstances, fashions and requirements

Changing a design concept after approval of preliminary drawings and cost estimates is expensive, in terms of the cost of the changes, the time it takes to implement them and the loss of revenue while the premises remain closed.

Variations in requirements should be indicated from the market feasibility studies and can, to some degree, be incorporated in the design.

The feasibility of providing for cyclical changes in operation must take into account:

- initial costs (extra equipment, storage space, alterations),
- extra revenue likely to be generated (wider market demand, increased sales, higher value of sales),
- operational difficulties (additional labour, shift working, differences in menu and style of service),
- effects on marketing (image and merchandising role, alienation of customer groups, conflicts in emphasis),
- company objectives and strategy for medium- and long-term growth.

Changes in operation may, however, be necessary to cater for different needs, for example:

<i>Needs arising from</i>	<i>Affected by</i>
Different meal requirements at midday and evening	Available time, convenience, motivation and expenditure
Cyclical variations from weekday to weekend	Leisure needs, available time and travel, family participation
Seasonal changes	Influences of weather and tourism on menu and requirements
Fashion changes and product life cycle	Competitive changes in attitudes and styles of living, refurbishing and renovation requirements

These aspects are examined in planning facilities (Chapter 4, section 2.04).

1.07 Individuality of design

Furniture, fittings and equipment may be obtained from:

- standard manufactured ranges,
- customised manufacturers,
- individual designs made to order.

Furniture manufactured for domestic use may not be sufficiently robust or durable, but special commercial ranges of furniture and furnishings are produced for restaurants, etc. Standard items are usually widely available and easily replaceable.

Customerised furniture or equipment is often available for substantial orders without significant increase in costs. This may include variations in weave of carpets and fabrics, incorporation of company insignia and customer designs in laminates and paints and modifications in construction. Replacement costs and other such difficulties should always be considered.

Individual designs include purpose-built equipment and furniture. This is invariably required for fixed seating, booth construction, counter and display fitting work.

1.08 Costs

Costs of investment in space, equipment and furnishings should be considered in relation to the nature of their use and their planned intended lifespan.

The costs in use of any item will include:

- initial cost of supply and installation, including any fittings and utensils,
- maintenance costs of regular servicing, renewals, recovering, redecoration,
- cleaning costs of day-to-day attention: laundering, vacuuming, polishing, washing,
- replacement costs of the whole item including damage and loss of income resulting from its removal.

Costs in use are discounted over the expected life cycle of the design project.

Space also represents a cost factor and the proportion of space available for revenue-producing activities is often crucial for the commercial feasibility of the operation.

Use of space can be represented in terms of:

- seating capacity (economy of space per seat),
- seat turnover (seat occupancy per day/week),
- revenue earning potential per seat (place or cover),
- gross sales per unit area (target projections per m²),
- profit ratios per unit area (financial strategy).

Investment criteria are examined in Chapter 2, section 6.03.

2. Integration: Scope of design

2.01 Factors affecting design

A design scheme must be carefully integrated with practical requirements. The designer must have a clear understanding of the way the restaurant is to operate. Equally, the design itself must incorporate or influence the choice of technical equipment and other components.

Aspects which must be considered include:

Exterior

- external presentation of the establishment, signs, motifs, menu display, window designs and dressing, entrances, canopies, stairs,
- external vistas, outdoor activities and associated terraces, patios and lawns, landscaping proposals.

Relationships

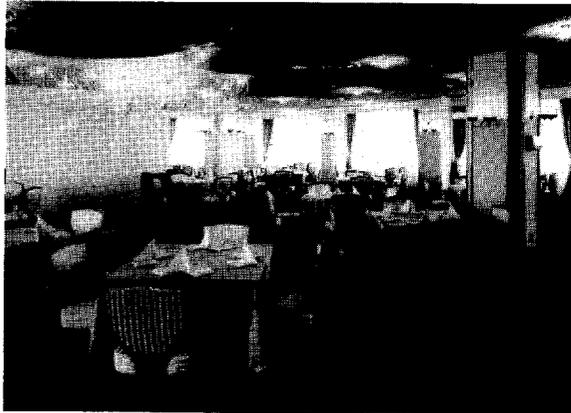
- planned layout of premises, spatial relationships between the restaurant, bar, kitchen and ancillary areas,
- intended circulation patterns of customers and staff.

Construction and services

- interior construction of restaurant and ancillary areas, existing linings and surface finishes, space and structural restrictions,
- types of engineering services – heating, air-conditioning, gas, water, lighting, power, communications – including positions of controls and terminals.

Operating standards

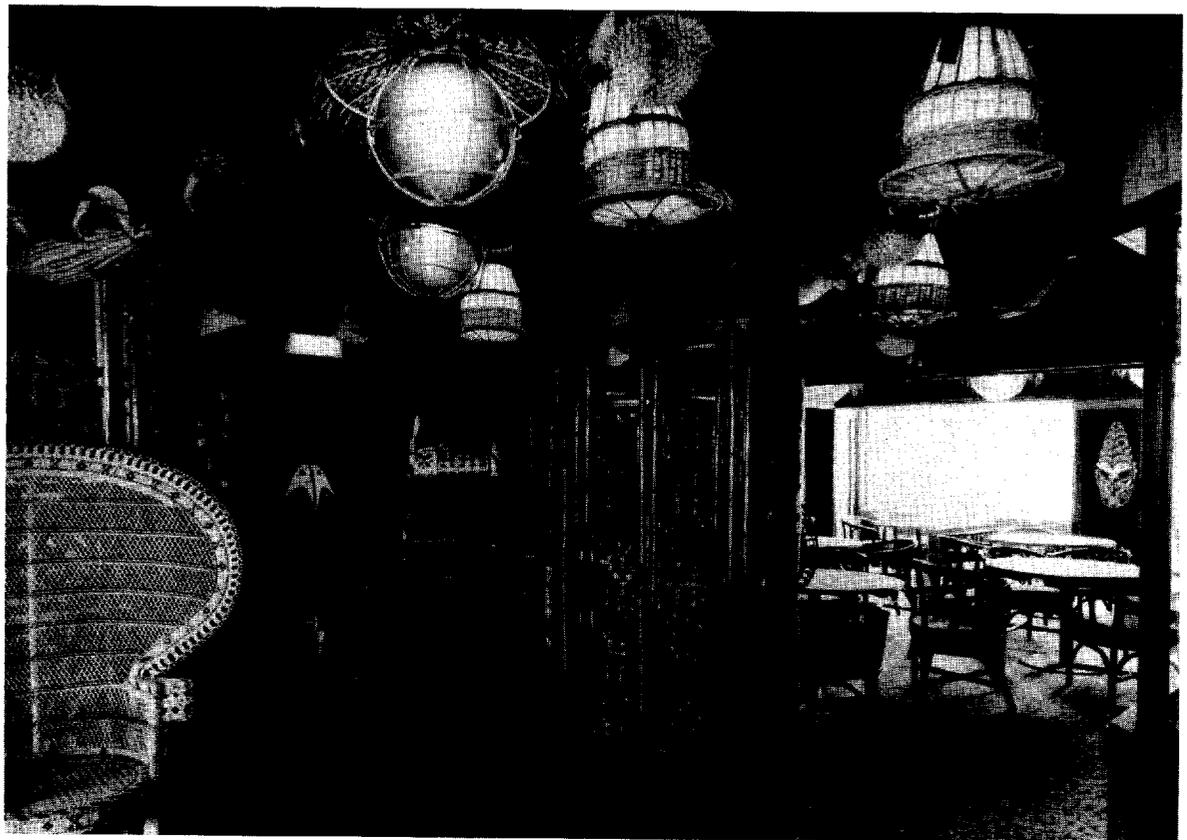
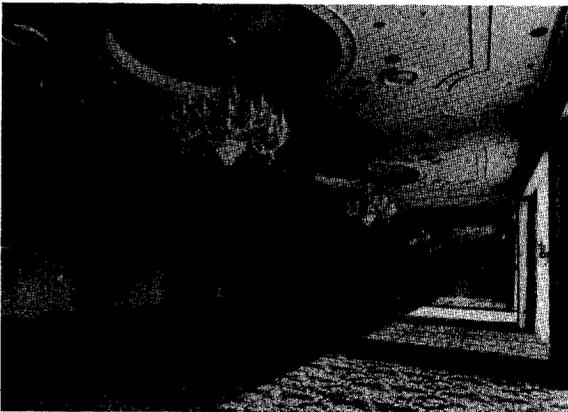
- seating capacity requirements, table groupings, anticipated seat turnover, extent of flexibility



New Otani Hotel, Japan

Examples of some of the contrasting styles of restaurants provided in the New Otani Hotel.

Architects: Taisei Architecture Co



in seating arrangements,

— method of food and drink service, service arrangements, staffing and support facilities.

2.02 Interior design coverage

- design plans and sketches, colour schemes, material and decorative specifications, construction and assembly details incorporating all associated lighting and sound equipment, ventilation terminals, fixtures and fittings,
- furniture requirements including sketches and detailed specifications, with supply and purchasing information,
- selected furnishings, such as carpets, curtains, upholstery, with specifications and purchasing schedules,
- details of special items such as featured displays, counter designs, sideboards, serving trolleys, cashier stations,
- provisions for safety from fire, sound attenuation and insulation, cleaning and maintenance.

2.03 Graphics and corporate identity

- design of exterior and interior signage, menu covers, place mats, coasters, table appointments and other stylised items,
- selection of tablecloths and napkins,
- styling of staff uniforms,
- design or selection of tableware, china, glassware, silverware, serving flatware, dishes and utensils,
- design and decoration of disposable utensils, containers and tablecovers as required.

2.04 Associated areas

Specialist interior design skills are also essential in creating a suitable ambience in lounges, bars and private function rooms. This coverage should be extended to entrance lobbies, cloakrooms and associated areas used by customers.

Kitchen design, food storage and cooking areas are often excluded from the main scope of



The Bonnie Prince Pub, St Moritz, Switzerland
Development of the English pub concept in Europe.

Design and build project: K. B. Contract

the design because they are considered to have more specialised requirements. However, if kitchens or service areas are visually linked to the restaurant in any way, they should be included in the overall design.

2.05 Framework for design services

Standard Forms of Agreement and the extent of services and responsibilities to be covered in interior design contracts are provided by the Society of Industrial Artists and Designers (SIAD) and the American Society of Interior Designers (ASID).

These broadly follow the lines of the Forms of Agreement drawn up by the Royal Institute of British Architects (RIBA) and American Institute of Architects (AIA) and provide a degree of consistency.

In making proposals for a design contract the designer must provide a statement setting out the services to be performed and the obligations and responsibilities. In particular the agreement must define the following:

- design, specification and purchasing services to be provided,
- scope of coverage, specific exclusions and conditions,
- responsibilities and obligations of the designer and owner,
- requirements for coordination with the architect and consultant,
- phases for developing and implementing the design work,
- procedure for approving the designs, costs and installation work,
- methods of payment of accounts and fees.

2.06 Phases

The work in developing and implementing a design scheme generally falls into five main phases, each phase requiring the approval of the owner before proceeding further.

<i>Phases</i>	<i>Main provisions</i>
Concept	Consultations on design criteria and programme. Owners requirements and conditions. Architects concepts and provisions. Design proposals, schematic plans
Design development	Development of design concept. Preliminary drawings, layouts, colour schemes. Outline specifications. Cost estimates
Working drawings and specifications	Production of final working drawings. Written specifications for tenders. Details of materials, finishes and construction. Purchasing schedules, budgets, cost estimates

Tenders, bids and purchasing arrangements	Organisation of competitive tenders. Evaluation and recommendations. Purchasing agreements and responsibilities. Supply arrangements and warranties
Installation	Supervision of installation and progress. Approval of performance and standards. Schedule of defects and omissions. Completion certificates

3. Expression in design

3.01 Sensory responses

A carefully executed design reflects ideas, associations or values which evoke some form of response in the viewer. These responses can be expressed as feelings or impressions, as shown by the following examples:

<i>Feelings of</i>	<i>Resulting from</i>
Visual appeal and emotion	Luminance, the richness of colour, texture, strength or delicacy of form
Excitement and vitality	Multiple reflection and transmission of light and movement
Place, belonging and spaciousness	Size and proportion of rooms in relation to size of people using them
Harmony and unity	Structure, symmetry, balance or contrast of the components and their surroundings
Warmth or coolness	Use of selective materials, textures and surface treatments to stimulate the tactile senses by touch or association
Perspective and illusion	Variations in light, shade and colour to emphasise or conceal space and form

These feelings may arise because of some previous experience and they tend to be heightened by an individual's sensitivity and education. Social and cultural influences also affect the way an individual interprets and responds to particular situations. As a rule, the higher the socio-economic group the greater the appreciation of the quality of design and this calls for higher investment in materials and skill. The need to relate restaurant design towards particular markets is examined in Chapter 3, section 4.02.

However, the subtleties of design can also be used to suggest higher standards of quality in both premises and food products. This approach is increasingly used by fast-food operators to differentiate between their products and other similar ones, and also to broaden the market appeal to family and mid-income groups.

3.02 Mood and atmosphere

Mood tends to affect choice and the way an individual responds to a particular experience, and people's moods can be induced or ameliorated to some extent by social and environmental conditions. Feelings of excitement or calmness, sociability or intimacy can be conveyed by the nature and intensity of design and interior arrangement.

Atmosphere depends to a large extent on the occupants themselves and the way they relate to their surroundings. A half-empty restaurant or bar has a different atmosphere to a crowded one. Visibility and awareness of the surroundings tend to reduce as the numbers of occupants increase.

An atmosphere of sociability and liveliness usually attracts customers and this is often deliberately built in to the design by way of bar seating, bright lights, background music, attractive staff uniforms and other features, including a contrived informality in the arrangement of space.

However, in many restaurants the acceptable level of background activity and crowding will depend on the extent to which this intrudes on the privacy of particular individuals or groups, and on

the social mix of the occupants. It will also depend on whether suitable standards of service, hygiene and individual attention can be maintained.

To some extent separation and privacy can be provided by suitable positioning and screening of the tables and seats, by providing a choice in variety of seating arrangements and subtle use of lighting to define areas of interest.

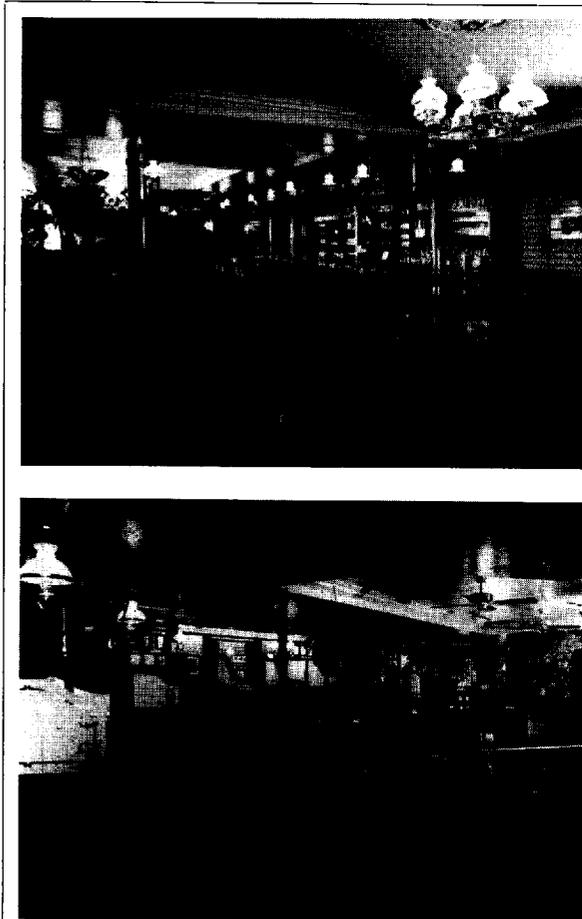
3.03 Style

Style distinguishes the main characteristics and manner of presentation of a design. The style enables a design to be recognised and understood.

In restaurant design the style is important in:

- *conveying information*: about the products, prices, type of operation,
- *creating a theme*: associated with the type of product style of operation, particular attributes,
- *establishing differences*: from competing establishments and similar experiences,
- *satisfying practical needs*: efficient operation, cleaning and upkeep under the conditions of use.

Styles of interior design, furniture and fur-



Duke of Kensington, Tulsa, Oklahoma

The brief called for the installation of a British-style public house/restaurant designed in Victorian style. The elongated area has been designed as a series of linked spaces providing a piano bar, dance area, darts room, TV viewing, bar with a raised booth seating area and a restaurant. Located within a shopping mall.

Mock beams, coffers and fibrous plaster cornices house air-conditioning and sprinkler systems. The decor is traditional with red/maroon velour fabric curtains and carpets, patterned maroon and gold wallpaper and mahogany woodwork.

Seating schedule:

Banquette seats	84
Chairs	77
Low stools	16
High stools	34

Total seats 211

Area of bar and dining room 3,145ft²

Space per seat 14.9ft²

Design and fitting out: Ayala-Abbott and Butters Ltd

Max Mendelssohn

Clients: Britannia Inc

nishings may reflect the artistic influence of an individual (Adam, Chippendale, Hepplewhite) or of a school or movement (Cubist, Abstract, Classical, Romantic, Art deco, Futuristic). Styles may also be identified with a period of history or cultural development with which they are primarily associated (Baroque, Rococo, Gothic, Regency, Victorian, traditional, contemporary). They may also be characterised by the traditional designs and materials used in particular countries or localities (Indian, Chinese, Spanish, Mexican, Thai, Scandinavian, French Provincial).

Although the basic features of a style may be recognisable, designs are constantly being adapted to meet changes in life styles, cultural appreciation, and commercial feasibility. In general, the trend is towards less ornamentation with clean, simple lines which rely more on colour, plainer patterns and textures and lighting effects than on the architectural structure.

3.04 Themes and styles of restaurants

Restaurant business depends on attracting customers, whose needs, interests and tastes vary widely. The range of choice offered is equally wide and is constantly changing, creating new

challenges for the operator and designer alike.

Basic themes in design may be expressed in several forms:

- mood – realism, escapism, novelty,
- period – historical, contemporary, futuristic,
- fashion – classical, modern, ultra-modern,
- ethnic origin – Chinese, Indian, Mexican,
- intensity – flamboyant, dignified, subdued,
- association – substitute domestic, naturalistic.

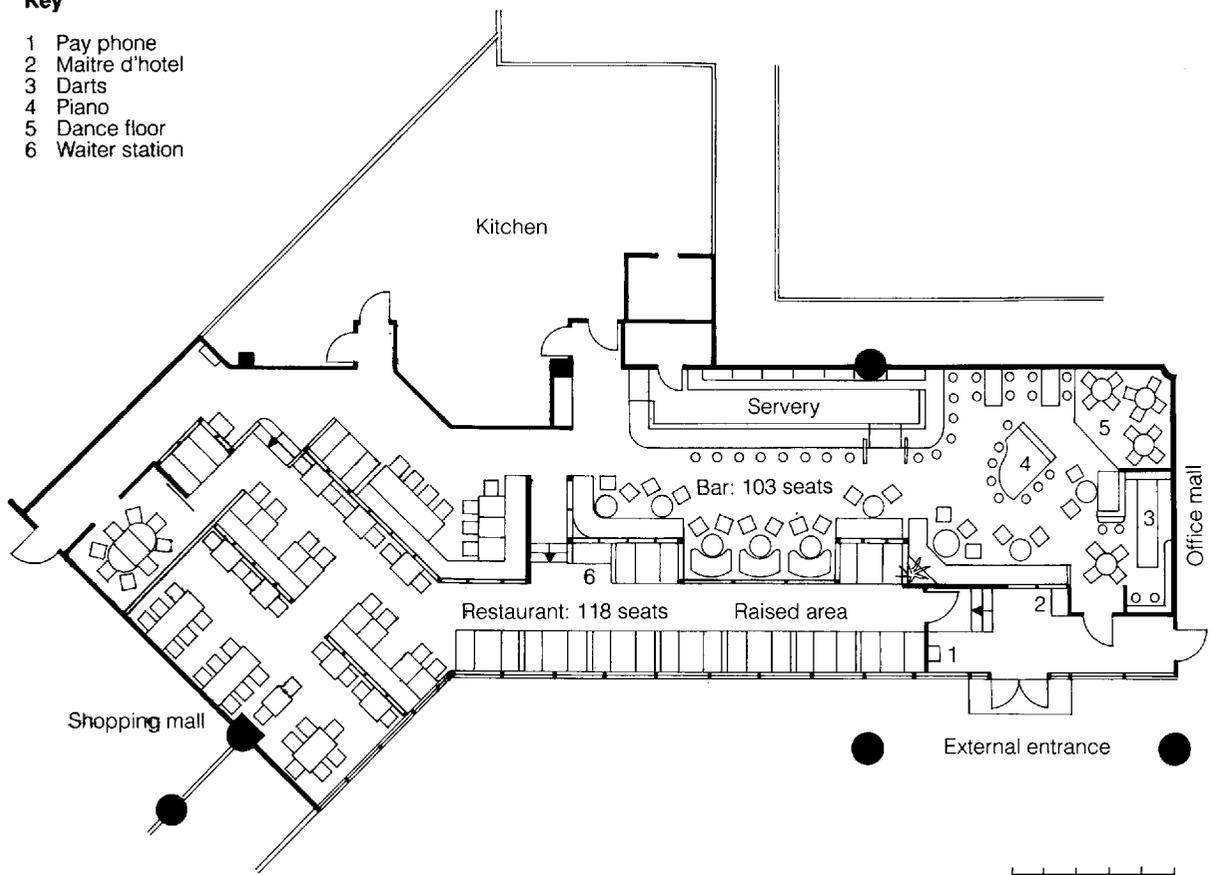
The design may also reflect the kind of food served and the way it is presented, for example:

- speciality foods – fish restaurants, steak-houses,
- showmanship – displayed preparation, featured equipment,
- customer participation – carveries, buffets, barbecues,
- family groups – table settings, family style service,
- fast foods – stylised counters, systemised production.

In every case research is needed to identify the particular features which characterise that style, the degree of authenticity required and the complementary requirements (of decor, furniture and tableware, etc) to provide a unified scheme.

Key

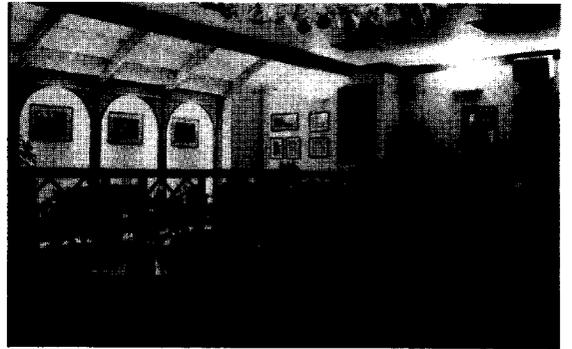
- 1 Pay phone
- 2 Maitre d'hotel
- 3 Darts
- 4 Piano
- 5 Dance floor
- 6 Waiter station



Turks, Newcastle

Redeveloped from the old Turk's Head Hotel in 1985, this new upmarket restaurant incorporates traditional Turkish patterns, colours and features. The existing shopfront of this listed building has been retained and a new kitchen constructed below the yard.

Architects: Katz, Vaughan, Meyer & Feltham
 Clients: Newcastle Breweries, Scottish and Newcastle Group

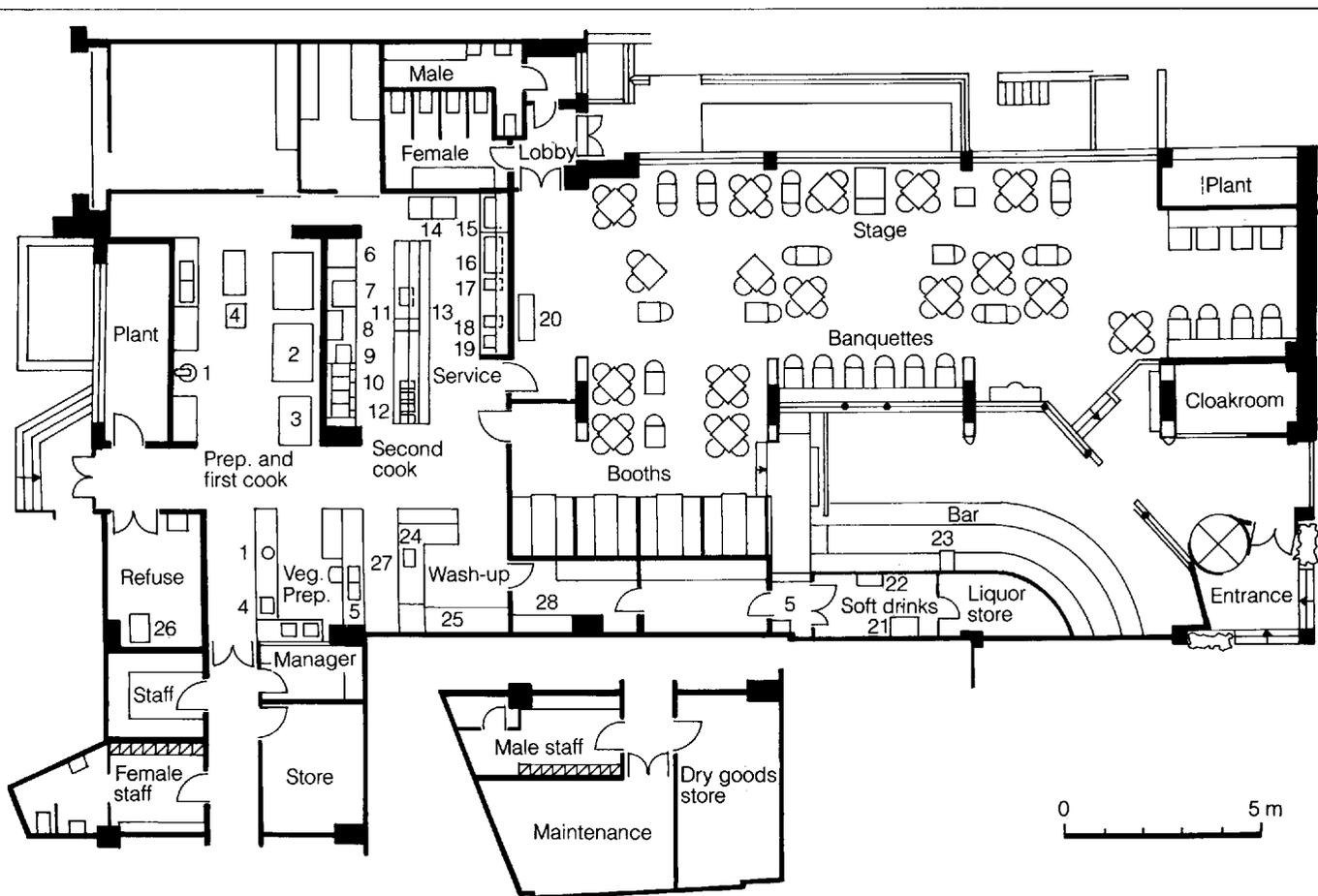


Chicago Rib Shack

One of the concepts pioneered by Bob Payton based on a combination of a well researched American-style menu in a theatrical Art Deco setting.

Architects: Broadbent Williams Ltd
 Clients: My Kinda Town





Preparation area and first cook

- 1 Mixer
- 2 Oven
- 3 Pizza oven
- 4 Vegetable machine
- 5 Wash-hand basin

Second cook area

- 6 Broiler
- 7 Microwave oven
- 8 Grill/salamander
- 9 Bain-marie

- 10 Fryers
- 11 Boiling top
- 12 Refrigerated unit

Servery

- 13 Tray shelf
- 14 Refrigerators
- 15 Ice cream conservator
- 16 Coffee machine
- 17 Milk dispenser
- 18 Towel steamer
- 19 Ice sink with post mix over
- 20 Service station

- 21 Ice maker
- 22 Post mix unit
- 23 Cash register

Support areas

- 24 Spray sink
- 25 Dishwasher
- 26 Compactor
- 27 Potwash
- 28 Electrical switchgear



Hampshire House

A fine example of the detailed recreation of the interior of an Edwardian drawing room as the setting for an elegant dining room.

Designers: Di Leonardo International Inc
Photographs: Warren Jagger



Ramada Hotel, Logan Airport, Massachusetts

A hotel restaurant which has a more intimate feeling with a combination of booth and free-standing seating. The ceilings of the restaurant and bar are reflective, adding to the vitality and interest.

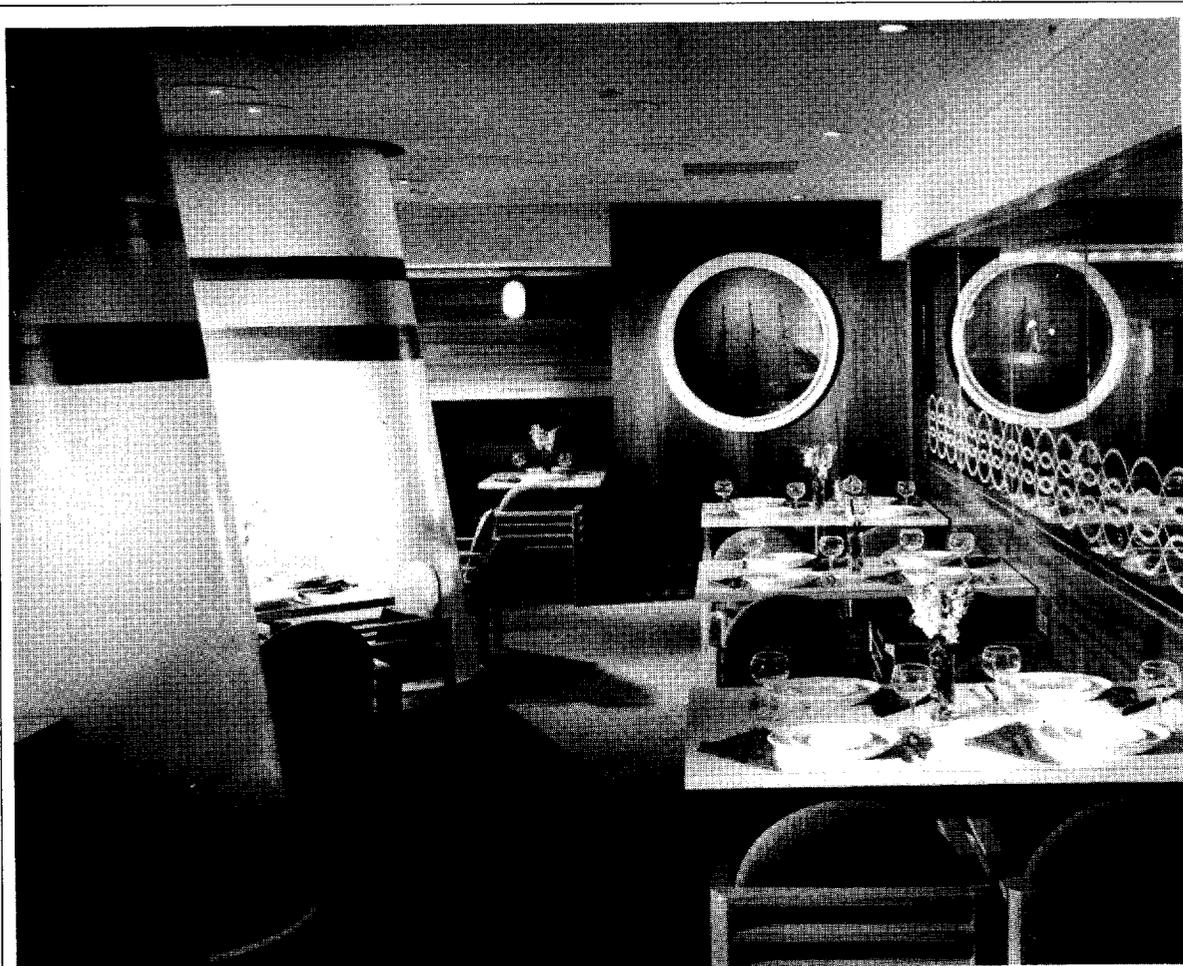
Designers: Di Leonardo International Inc
Photographs: Warren Jagger

Huckleberry's, Stuart, Florida

Another Di Leonardo design, in this case providing an informal, relaxing, tropical style emphasised by the use of natural wood, wickerwork and tiling.

Designers: Di Leonardo International Inc
Photographs: Warren Jagger





Seafood Shanty, Wyrnwood, Pennsylvania

The Seafood Shanty bar and restaurant has a nautical theme, reminiscent of the atmosphere of the 1930s liners and complements the speciality menu. This period theme is also reflected in the bar.



(a)

45, Park Lane, London.

Previously occupied by the Playboy Club, 45 Park Lane has been renovated to form a private sporting club of international prestige. Designed by Ezra Attia, each of the five floors has its own distinctive character created by the dramatic use of colour and specific features.

In the Ground Floor café facing the park light natural woods suggest the flow of trees and gardens in to the room and this is contrasted by a blue and terra-cotta decor. To counter the long narrow dimensions the floor has been split into two levels. (a)

The restaurant on the Second Floor combines classical period of furnishings with sophisticated modern features including the use of a bronze aluminium ceiling to conceal its relatively low height. (b)

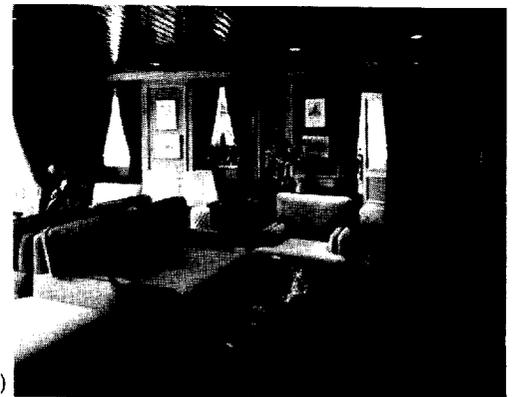
As the ante-room to the restaurant the 16 seat cocktail bar reveals draped glimpses of the interior without intruding on privacy. (c)

There is also an elegant private dining room on the First Floor adjacent to the gaming room.

Designers: Ezra Attia Associates



(b)



(c)

3.05 Compatibility, consistency, orderliness

Interior design must be seen as part of an operating system. The style, character and function must be compatible and every aspect of design and decor must be considered in relation to both its visual impression and functional use.

<i>Design considerations</i>	<i>In relation to</i>
Visual: degree of sophistication extent of originality acceptable standards of space and quality	type of clientele, market orientation, periods of use
Functional: functional durability resistance to damage retention of appearance ease of cleaning or re- placement extent of maintenance and protection	role, nature of use intensity of use frequency of cleaning and attention, proximity to user

Whatever style or standards are adopted the design must be *consistent* throughout. *Accuracy of detail* demands careful design or selection and specification of all items of fittings, furniture, furnishings, equipment, tableware, graphics, uniforms, etc, to suit the type of menu and style of service. *Authenticity* in the use of traditional designs and equipment – such as for ethnic or speciality restaurants – will usually require background research. As a rule it is not appropriate to combine:

- traditional styles from different countries or regions (classical and provincial),
- characteristic styles from different periods,
- or sophisticated, fine, ornamented materials and workmanship (porcelain, silver, fine linen, velours, walnut, etc) with those which are rustic and coarse in nature (earthenware, stainless steel, place mats, homespun, pine).

The design must *identify* with and be complementary to the menu and style of service. Design has a merchandising role in

- distinguishing or characterising the type of operation,
- providing immediate recognition,
- catering for the customers specific requirements (convenience, relaxation, sophistication).

To establish a distinctive, recognisable style (*branding*) associated with a particular type of product, many chain and franchised operations adopt a rigid corporate design for all units. The brand design must be:

- reproducible in all premises,
- repeated throughout to provide reinforcement,
- consistent in style, quality and performance.

Branding imposes constraints as well as advantages. No one premises must be better or worse than others, and consideration must be given to maintenance and life cycle implications.

Orderliness suggests good organisation, efficiency, high standards of hygiene and control. A well-ordered layout gives a sense of perspective and spaciousness. Excessive orderliness, however, tends to make a restaurant or bar impersonal and formal.

Clutter and congestion may arise from disorder, unplanned additions or misuse of space or equipment.

Personalisation of space is usually a necessary feature of design, with contrived individuality of seating areas, variations in lighting and the introduction of diverting features of interest.

Flexibility may be a crucial factor in allowing for variations in use and in grouped seating arrangements. Provision may be made for loose furniture throughout or over part of the area. Flexibility generally requires additional storage.

4. Inter-relationships

4.01 Horizon of interest

Horizons of interest for particular seating positions may be

- long-distance views, vistas, activities (see Chapter 4, section 1.04),
- mid-distance, displays, features, activities,
- near distance, table setting, food, beverages, company.

While the focus of attention will constantly change, the most evident benefit (view, interest, company) is the one usually associated with that establishment. For badly placed seats, there should be other benefits by way of compensation (see section 4.02).

Lighting is particularly important in attracting or diverting attention, for example:

<i>Illumination emphasis</i>	<i>Brightness ratio scalar: vector</i>	<i>Behavioural tendency</i>
Near horizontal surfaces (downlighting, table lighting)	1:1–100:1	Intimate or gregarious social activity Interest focused on table and immediate company
Distant peripheral surfaces (wall and curtain lighting)	1:20–1:100	Introspective, privacy Relaxed, detached interest in surroundings

The use of lighting in design is examined in section 5.6.

Some objects and particular features may, by their proximity to diners, be subject to greater scrutiny and longer examination than the general surroundings. The standards of presentation, maintenance and cleanliness of table covers and appointments are critical in establishing customer confidence.

Horizons of interest may be extended by the use of picture windows (without glazing bars), to extend the flow of space to the exterior and by the strategic positioning of mirrors to extend space and reflect features.

4.02 Circulation and seating areas

Circulation routes for customers and staff must be planned to minimise disturbance (see Chapter 4, section 2.06).

- Seating preferences are generally:
- near windows and outer walls,
 - around the periphery – with alcoves and personalised areas,
 - near particular features of interest or displays.

Less advantageous positions require positive design steps to minimise disturbance or annoyance:

<i>Location</i>	<i>Design treatment</i>
Near doorways	Seats facing inwards
Serving entrances and stations	Partly concealed by decorative screens or ornamentation Draught proofing and sound attenuation may be required
In centre of room	Dwarf partitions, screens, planters used to divide space – without isolating areas

Seats and tables adjacent to a wall or screen must allow for access and for 'reach' in serving food (see Chapter 7, section 1.04). To minimise damage to the wall the design may provide

- protective panels: about 1200mm (4ft) high in framed wood or plastic laminate,
- fixed booths: in rectangular or triangular arrangement with fixed seats and tables,
- fixed banquette seating arranged against the wall with 100mm (4in.) clearance for head movement.

Equality of treatment is important in planning seating layouts. Each seat must have particular benefits or advantages. Examples:

- bar seating provided for sociability and conspicuousness, table seating arranged in personalised areas,
- window seating for views. Seats in the interior designed with greater variety (banquette seating, alcove groups) and local features (paintings, screens).

4.03 Scale, proportions and balance

Correct proportions are an important aspect of design because they provide visual balance and harmony. The various parts of a unified scheme must be in scale with each other and with the room as a whole.

<i>Considerations</i>	<i>Design implications</i>
Anthropometric and ergonomic requirements	Affect the working heights of counters, extent of reach (widths), seat heights, angles, arms and backs of chairs; clearances for access
Functional aspects	The size of tables depends on place settings and style of service. Function dictates the design of counters, bars, sideboards
Height relationships	Between chair and table and stools, counters and footrests (see Chapter 7, section 1.04)
Personalisation	Human scale of design. Separation of tables, use of alcoves and individualised spaces
Proportions	Relationship between design, size and weight of contents and room space
Large, imposing rooms	Large, heavy proportioned and ornamented furniture, fittings, patterns and displays. Seating extended into the centre of the room
Small rooms	Furniture light, open framework with thin sections and low seat backs. Tables used without cloths. Arranged around perimeter leaving central space for circulation
Proportions (classical)	Proportionate relationships between dimensions: 2:3, 3:5, 5:8, 8:13
Horizontal division	Normally between 1/3 and 1/2 down from ceiling (for separation of panels, height of fittings, pictures, etc) depending on head clearance
Balance	Symmetry of distribution of large and prominent features (furniture, decoration, pattern)
Formal setting	Symmetrical arrangement of furniture and fittings in balanced design
Informal layout	Asymmetrical positions of prominent counters, bars and windows balanced by accents of bright colour, pattern, wall panels and hangings
Rhythm	Flow of visual interest from one feature to the next by extended

Repetition	lines, linking of design, continuity of patterns and colours. Used to draw attention, to extend space and to provide linkage between areas To stimulate eye movement and reinforce the flow of design. Patterns normally have a small, repeated design because they can be obscured by furniture and because of the need for camouflage of marks. Repetition of motifs and logos is essential for brand merchandising
Lines	Tend to draw the eyes upwards or outwards to create optical distortion of dimensions. Used to correct room proportions or for other design emphasis (see section 5.1)
Colour	Warmer colours, greater intensities and darker values tend to give more visual weight and dominance (see sections 6.04–6.07). The eye tends to travel from dominant to subdued tones
Texture	Coarse textured surfaces are more tactile and have greater visual prominence than smooth textures (see section 5.4)
Natural light	Depth of natural light penetration is usually about 1.5 times the window height. For a 3 m (10 ft) high window head, penetration is about 4.5 m (15 ft)
Windows	Large, wide windows allow easier balance and flexibility in seating plans. With narrow windows, tables and chairs may need to be placed more centrally

4.04 Ceiling heights

The height of the ceiling should be in proportion to the size of the room. If a room is divided the heights in the smaller areas (alcoves, seating precincts) may need to be proportionately reduced to retain balance.

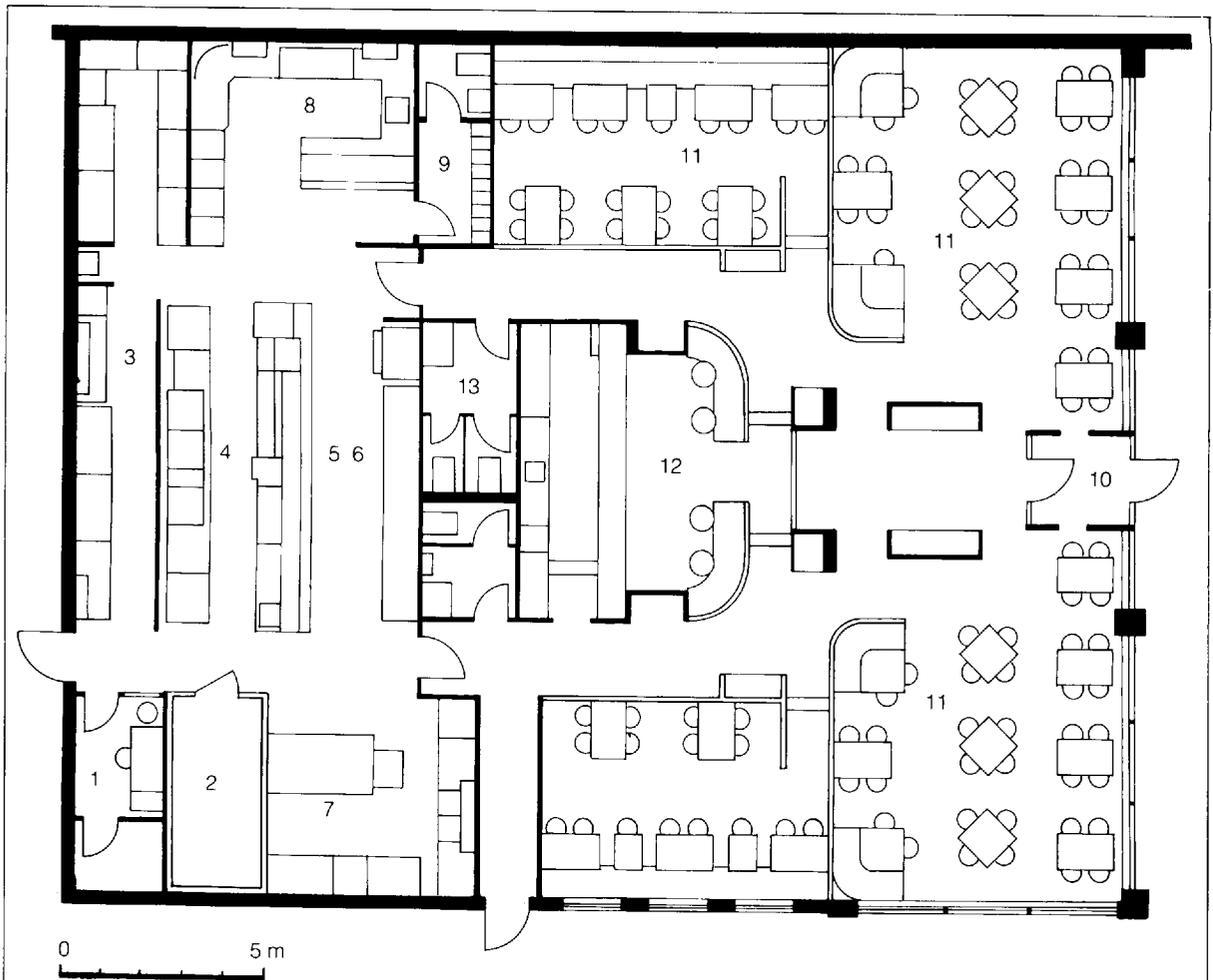
<i>Room heights</i>	<i>Difficulties which may arise</i>
Minimum, 2.5 m (8 ft)	Limited to small areas. Creates sense of oppression in large rooms. Difficulties may arise in ventilation and air distribution, light diffusion and positions of luminaires
Normal, 3.0 m (10 ft)	Appropriate for most small to average size rooms
High, 3.5 m+ (11 ft 6 in.)	High ceilings produce impersonal space. In hot climates spatial height is conducive to relaxation.

With formal designs high ceilings create a sense of grandeur and occasion (for banquets, receptions)
High ceilings may give rise to stratification of air with large temperature gradients. Luminaires usually need to be suspended at lower levels
Unightly high ceilings may be visually screened by creating a plane of light at a lower level

4.05 Emphasis

A design needs some point of interest, one or more features which will dominate the composition. In restaurants and bars several key features may be used but too many points of emphasis will only be confusing.

<i>Emphasis</i>	<i>Design treatment</i>
<i>Physical features</i>	
Windows	If the view is spectacular or dominant, window treatment may be underplayed (simple curtains, bare glass). The decor of the room should be related to the view (hue, value, pattern). For evening use, long, draped curtains with concealed window lighting provide soft contrast
Balconies	Balconies are a feature of interest and provide a visual link between areas. Raised areas with balustrades also create variety and contrast
Fireplaces	In lodges, public houses and inns the fireplace may provide a focus of attention. This may be characterised by adorning it with traditional implements and utensils
<i>Services</i>	
Self-service counters	The design of counters is mainly dictated by functional requirements (food display, holding, information, convenient access and circulation with trays). Features of design to soften impact include decorative panels and fascia, attractive tiled surfaces, treated and simulated wood (laminates) and screens between seating area
Bars	Bar design is important in creating social atmosphere. Design features include back-bar displays of drinks, with bright lighting, mirrors and glasswork to create sparkle and vitality, decorative fascias and side orna-



Vis-à-Vis Restaurant, Des Peres, Missouri

Vis-à-Vis has been designed to seat 140 diners in five seating areas which allow intimate grouping without restriction in service or visual interest. A central bar provides a link between a café-style lower level dining area and an upper dining area, symmetrically balancing each side. The focal point is a large carved glass wall Erte figure indirectly lit to highlight the design at night.

Vis-à-Vis showcases wine and serves moderately priced continental cuisine.

Designers: Hotel-Restaurant Planners: a division of Professional Interiors Ltd

Food preparation and service

- 1 Office
- 2 Cold store
- 3 Food storage and preparation
- 4 Food cooking
- 5 Hot food service counter
- 6 Beverage stands
- 7 Cold food service counter
- 8 Dishwashing
- 9 Staff room

Restaurant

- 10 Main entrance
- 11 Dining areas
- 12 Bar
- 13 Toilets: female male

	ments, ornamental canopies to give height balance (incorporating ventilation and lighting)
Displayed cooking, self serve and/or self-selection of food	Equipment is usually built into units with attractive panels, brass or copper canopies (for fume extraction), decorative infrared lamps over cooked food display and other features
Food trolleys, displays	The trolley provides a moving focus and is often elaborately designed to present a selection of food attractively arranged. Fixed food displays may be a central feature of the room with radial arrangement of furniture and circulation
<i>Other methods</i>	
Repetition	Repetition of colour, line, shape or texture can be used to add emphasis to any element
Contrast	Contrast of rough textured panel, decorative screen or woven display with smooth walls. Colour contrasts such as small areas of intense warm colours on neutral background, white against black. Drapes and curtains in strong contrast to wall decoration
Displays	Pieces of art relevant to food or local interest, including antiques and paintings, with directional lighting and background. Contrasts to draw attention. Displays must be used with discretion to avoid distraction and confusion

Marine Palace Hotel, Turku, Finland

In carrying out a complete refurbishment of the bar and restaurant of this modern hotel the designers decided on a marine theme which would complement the riverside setting and port environment.

Nelson's Bar (a) has been designed as the interior of an old ship's cabin using rich mahogany panels, brasswork, simulated planking and mast construction.

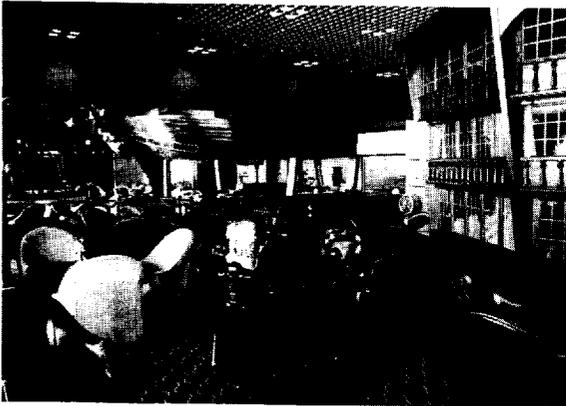
The Mediterranean Restaurant on the ground floor (b) has a light, airy atmosphere with white trellis archways and panels, bentwood cane chairs and vinyl tile flooring to match existing marble tiles. The columns feature six locally sculptured caryatids.

On the first floor a large restaurant and night club, seating 274, features a ship's prow cut away to serve as a bar (c), masts and a glazed galley surrounding the staircase head (d).

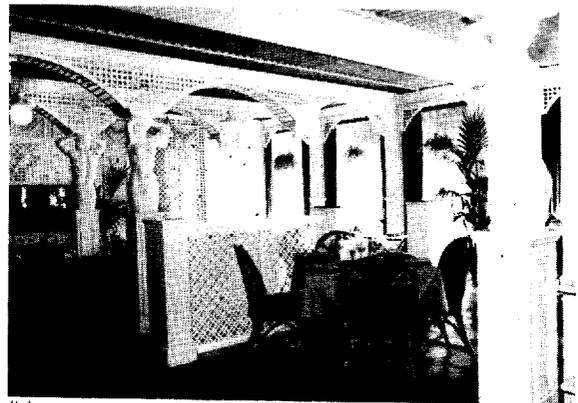


(a)

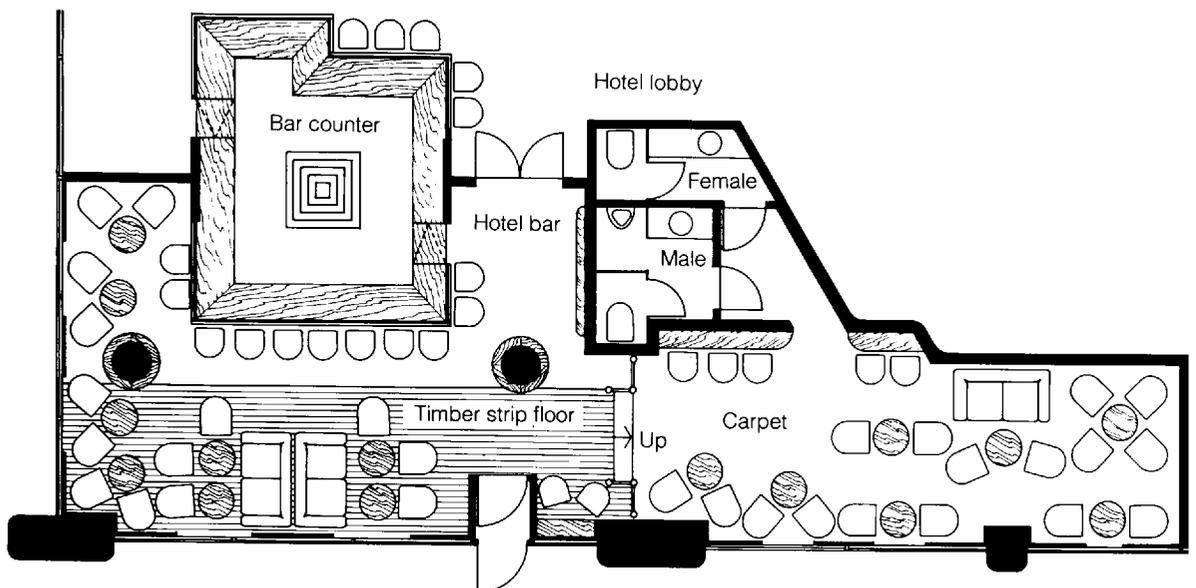
Design and fitting out: Ayala-Abbott and Butters Ltd



(a)

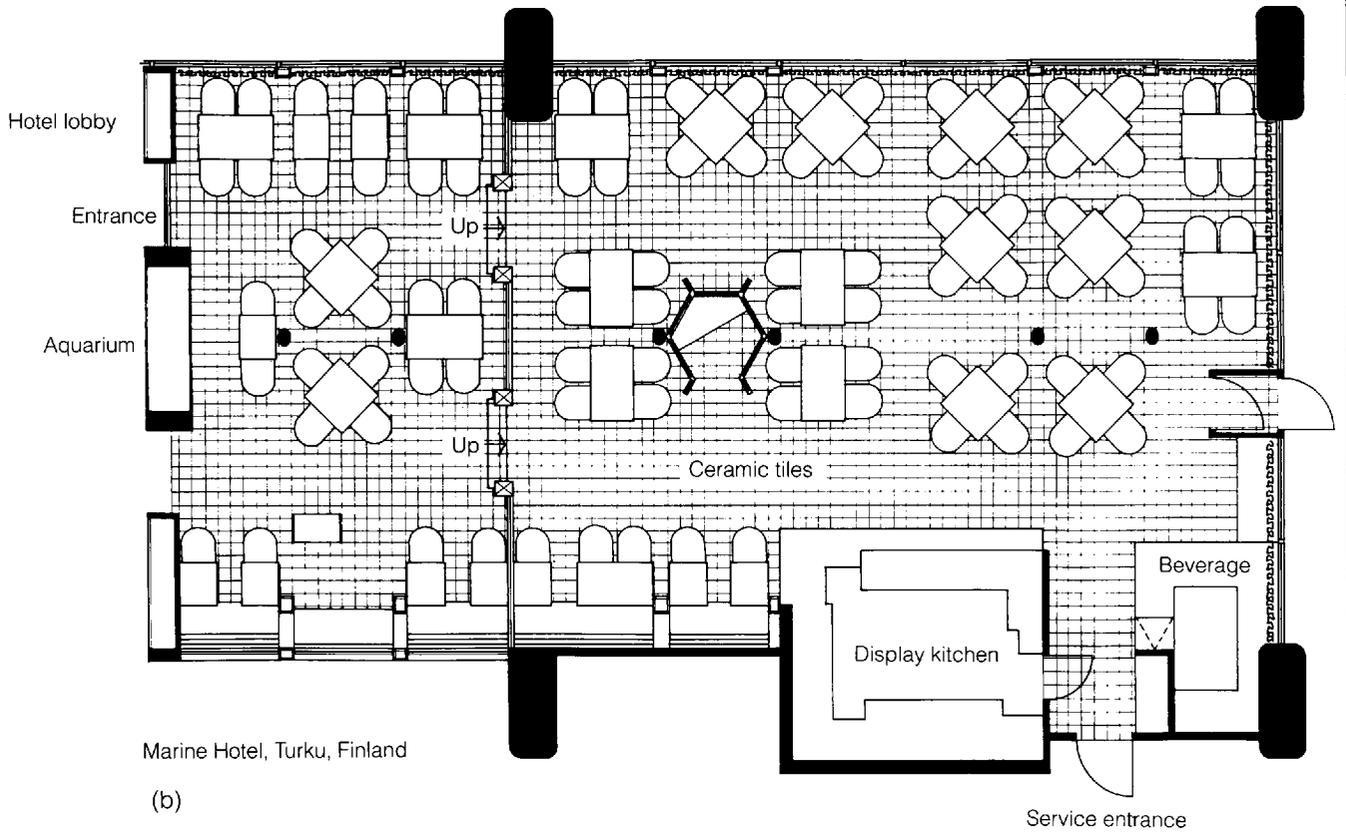


(b)



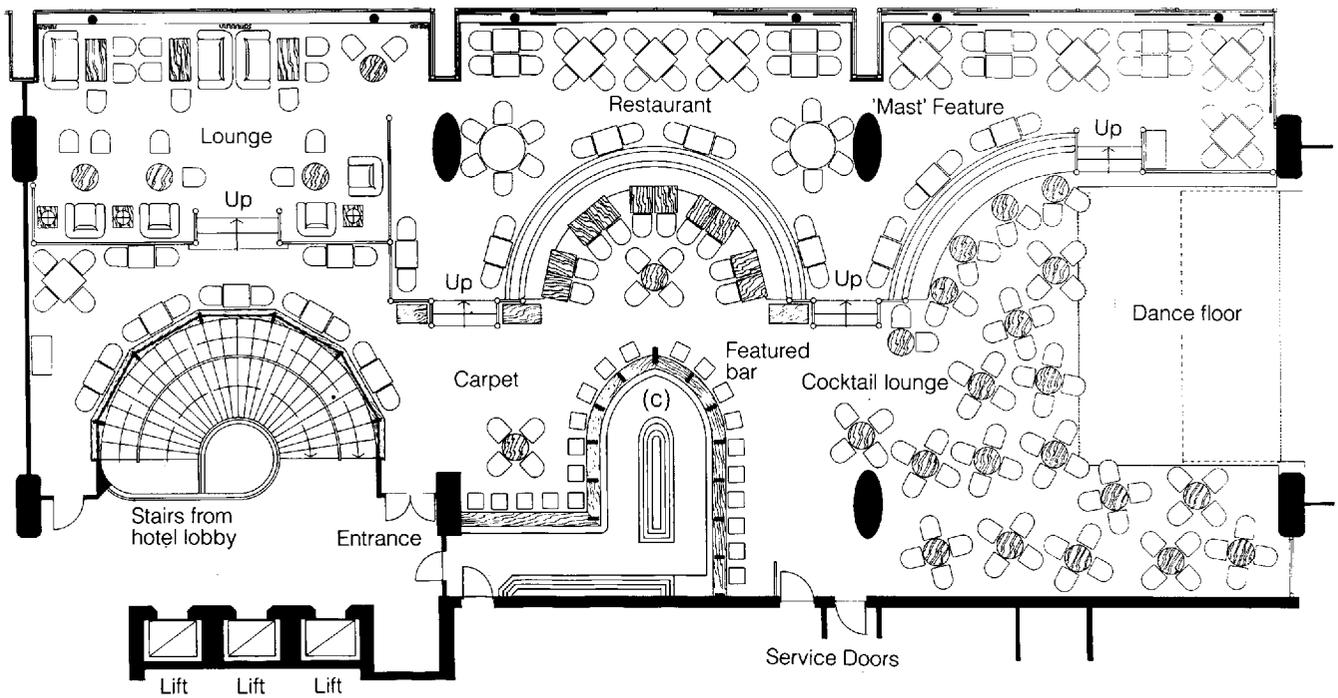
Nelsons Bar

(a)



Marine Hotel, Turku, Finland

(b)



(d) Restaurant and night club Marina Palace Hotel, Turku

4.06 Unity, linkage and enlargement

A design must provide a sense of unity within the whole area. Unity in composition is expressed in a common theme, links between areas, extended and repeated use of certain identifying elements and continuity of space. This also applies to rooms which are extended or modified to create additional floor space.

Floors are usually the same level throughout for easier circulation, cleaning and safety.

Changes in level

Any changes in level should be limited to those places where they are to be expected: in division walls, between rooms, outside doors, entrances and landings. They should be clearly marked with distinguishing edges. Recessed lighting may be used to indicate steps. Where practical, three steps should be used with proportioned treads: not less than 300 mm (12 in.) and risers not more than 150 mm (6 in.).

Balconies, mezzanines and galleries

Balconies, mezzanines and galleries can be introduced into those areas that are difficult to light, heat or air-condition efficiently. Problems of access, height, fire resistance, structural design and engineering services must be considered.

It may be possible to gain extra headroom by removing part of the existing ceiling and repositioning ventilator ducts and other services. As a rule, a mezzanine is more appealing than a fully divided floor because it enables spatial links to be maintained. Usually up to half the area is usable.

The means of food and drink service should be considered and a food hoist or elevator may be required. Each level may have its own service bar or counter. One solution is to provide a lounge and bar at mezzanine level or a different style of service.

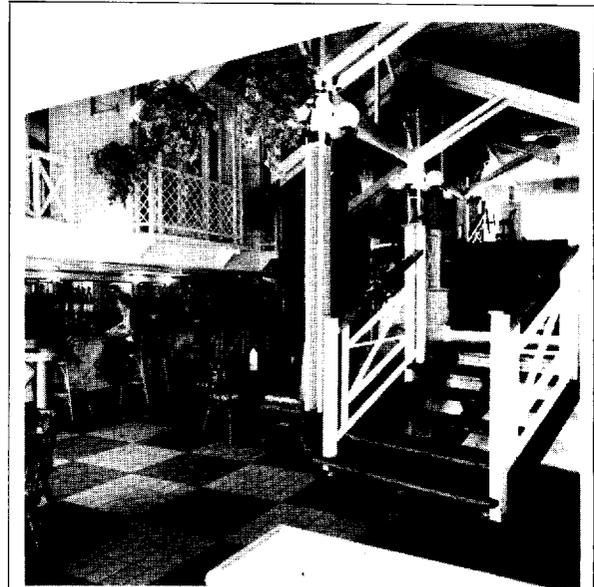
Separate dining areas

If extension or conversion can create a separate dining area this may be designed as an alternative style of restaurant or bar with a different menu, price structure and service. Both may be served by a centrally positioned kitchen or each may have its own small service kitchen (see Chapter 8, section 1.01).

5. Elements of design

5.01 Use of components

A design scheme is made up of a large number of components. The way these are used, empha-



Prince of Wales Public House, London

This bar was last revamped in the early 1960s and completely replanned in 1985 to create a double height bar with a mezzanine area, the interior being designed as a theatrical street scene. A conservatory extension at first-floor level also provided a wine and cocktail bar with a new food counter service.

In the year following completion turnover increased by 35 per cent with a widening clientele base.

Design consultant: Lee Associates Ltd

Clients: Sovereign Hosts

sised and interrelated, communicates information and emotive feelings. Elements of design include lines, shapes, forms and spaces which create physical dimensions, optical illusions and impressions of scale and space.

Lighting and colour, used both as a means of illuminating and modelling can be combined with textures and patterns to provide contrasts of light and shade, warmth or coolness and emphasis or concealment.

5.02 Lines

A predominance of particular sets of lines can be employed to emphasise dimensions and character. Dominant or repeated combinations of lines compel the eye to follow and can be used to create illusions of height, width, strength or delicacy.

Lines used for decoration must be balanced against structure features, furniture and accessories. The overall effect must be compatible with the style of furnishing and mode of use.

<i>Predominant lines</i>	<i>Evoked responses</i>	<i>Examples of application and correction</i>
<i>Straight</i>		
Vertical emphasis	Expresses strength and forcefulness, can create dignified atmosphere and gives illusion of greater height	Used to create character. For functions, banquets. With low ceilings, mezzanine floors
Horizontal	Suggests spaciousness, relaxation informality and appears to increase width	Over use of horizontal lines (tables, seating, counters) requires balancing to provide more intimate areas
Diagonal lines	Seem to point to space and tend to keep eye moving. (Chevron design with opposing diagonals arrests movement). Over-use of diagonals tends to weaken visual unity of design	Diagonals may result from repetitive positions of tables and wall-mounted fittings Combinations of diagonal (staircase design) and vertical interest (pendant lighting, decorative balustrades) may be used to encourage customers to ascend stairs to restaurants above street level
<i>Curved</i>		
Circles and full curves	Induce cheerfulness particularly with bright colours and contrasts Too many curved lines can produce restlessness	Circular designs and motifs are widely used in popular catering and fast-food promotion Circular tables and bent wood chairs are used for family grouping as a contrast to fixed booths
Voluptuous, full and complex curves	Sinuosity of line and form suggests splendour, opulence and theatricality	Baroque and rococo styles featured in 18th- and 19th-century designs of the grand hotels, casinos, music halls and gin palaces. This flamboyance is still expressed in cocktail bars and gambling clubs
Softer, delicate curved lines and shapes	Delicate curves combined with fine proportions suggest gracefulness and refinement Classical styles suggest good taste	Elegant, classical styles of furniture and furnishing used for high-class hotels and banqueting rooms. The decor must be harmonious

5.03 Shapes, forms and spaces

Shapes are two-dimensional (artwork, patterns, plans) while form describes solid objects within a space (furniture, building features). Both shapes and forms can be categorised as:

- rectilinear: square, rectangle,
- angular: triangle, pyramid,
- curved: circle, sphere, cone or cylinder.

Repetition of shape (rectilinear tables, seating, counters, windows, panelling, tiling, etc) provides continuity and order but does not allow for psychogenic needs, personalisation of space and territorial identity (see section 3.05 and Chapter 3, section 5.05).

Liveliness can be created by deliberately introducing round tables, variations in grouping of furniture and pictures on the wall and accessories which establish new areas of relationships.

Different functional spaces may be created in a large room while still retaining the unity of design by:

- placing of furniture, screens and planters,

- changes in pattern, colour and texture,
- physical divisions using booths and alcoves.

5.04 Pattern

The growing trend in interior design is towards economical simplicity in construction work (see Chapter 6) with greater reliance on colour, texture and pattern:

- patterns and textures offer increasing scope for interest and variety with the introduction of new materials and lighting effects,
- designs can be renewed or changed without structural alteration, major interruption of use or expense.

In restaurant design, patterns can be created by:

- the shapes and arrangements of tables and chairs,
- effects of light on different surfaces and textures,
- decoration of walls and furnishings,
- designs in carpets and flooring.

5.05 Effects of pattern

Applications

- patterns suggest movement and the rhythms must be in keeping with the character of the room,
- repetition of a pattern or patterns of a similar colour, style and scale in different areas can help to unify a design,
- patterns can be used to camouflage marks and wear and tear in carpets and table surfaces. The most effective are small, repeated patterns, marbling and graining,
- overall patterns appear to raise the surface and may be selectively used to correct the proportions of a room,
- over-use of patterns can crowd a room and become a distraction.

Size and prominence

- Strong coloured patterns may produce flickers of movement in the eye and induce irritation and visual fatigue,
- large, sharp patterns are best seen against a neutral background and from a distance,
- the size of a pattern should be related to the size of the area decorated and to the parts which can be seen,
- small patterns tend to recede and merge into the background,
- patterns must not compete with important focal points (counters, signs, displays).

5.06 Types of pattern

As a broad classification, Patterns may be broadly classified into five groups:

- *simple geometric forms*: circles, squares, triangles and identifiable shapes produce strong, subjective effects; they also tire the eye and distract attention. The full effect of a bold distinctive design is best displayed on a large expanse of wall or floor. Close, repeated circles and squares produce a flickering effect and are better linked together (interlacing, scroll work),
- *asymmetrical grouping of formal shapes*: asymmetrical grouping may be based on formal or stylised designs. The selective use of motif design (repeated in menus, etc) can help to establish a corporate identity,
- *irregular formally arranged patterns* include naturalistic designs. Spacing and prominence may be critical in order to avoid confusion,
- *free-flowing patterns of indefinite shape*: light and shading effects of curtains and draperies provide a balance of colour and contrast of texture with plain surfaces. The greater the emphasis on quality of food and service the more the decor recedes into a background of elegant simplicity.
- *abstract designs*: compromise between art and design by introducing a sense of movement

and creativity into field of view. Abstract designs may be symbolic representation of food or a theme of the design. Different media and materials can be used (three-dimensional surface relief, tapestries, paintings). They are best mounted in a prominent place, visible from a distance throughout the room and balanced by neutral surroundings with complementary design of furniture and fittings.

5.07 Texture

The selective use of texture as a feature of design stems partly from increasing sophistication in lighting schemes. Texture stimulates senses of touch either directly or by association.

There are four main characteristics:

- *soft rough*: presents a broken up surface which absorbs light and tends to look darker and appear closer than it is. Softness suggests warmth and can be in strong dark colours,
- *soft smooth*: cover a wide range of close pile fabrics such as velvets, linens, silks, satins, leather and vinyl used in furnishings and upholstery. Rich appearance produced by sheens and shades of light with soft folds (materials may be mercerised, satinised),
- *hard smooth*: most traditional interior finishes (plaster, marble, glass, tiles) give a coldness and severity which must be softened by the use of textiles, carpets and soft furnishings. Can be tempered by warm colours,
- *hard rough*: exposed stonework and brickwork produce strong, penetrating impressions which can be emphasised by directional lighting. Employed in natural colours (neutral) and in small areas (usually one wall). Encroachment balanced by hard, smooth backgrounds. Harshness softened by rough fabrics.

Other considerations include:

- *surface treatment*: woodwork, leather, brass, copper work, etc, can be worked to contrast and blend with other materials. Surface reflection may be altered by gloss, satin, matt or textured coatings,
- *cleaning and maintenance*: rough textured surfaces are liable to become dusty, dirty and stained by condensation or greases. With a high seat turnover, tables, chairs and other used items must be easily wiped clean (hard, smooth, non-absorbent).

Consideration must also be given to durability (resistance), appearance (surface marking) and veiling reflections (matt or grained surface). For longer meal periods and table service, linen cloths and napkins soften and compliment the textures of tableware and colours of food, wine, etc. Carpets must be of good commercial quality with a dense pile and patterns which resist the effects of wear, soiling and frequent cleaning (see Chapter 7, section 4.01).

- *noise*: soft materials generally absorb sound

and can be used to control acoustics. An interior with hard surfaces may require acoustical ceiling or panel treatment (see Chapter 6, section 4.01).

6. Lighting and colour

6.01 Visual adjustment

The human eye can cope with a wide range of lighting conditions from about 0.001 lux (0.001 lumen/ft²), the faintest light discernible, to 10,000 lux (1,000 lumen/ft²) for a bright sun on clean snow. Large print is usually readable at about 0.2 lux (2 lumen/ft²).

6.02 Natural light

The use of natural light during the day in restaurants and, where possible, in clubs is always preferable. This saves money, has psychological benefits and allows colour discernment.

Provision should be made for even distribution and screening of light where necessary.

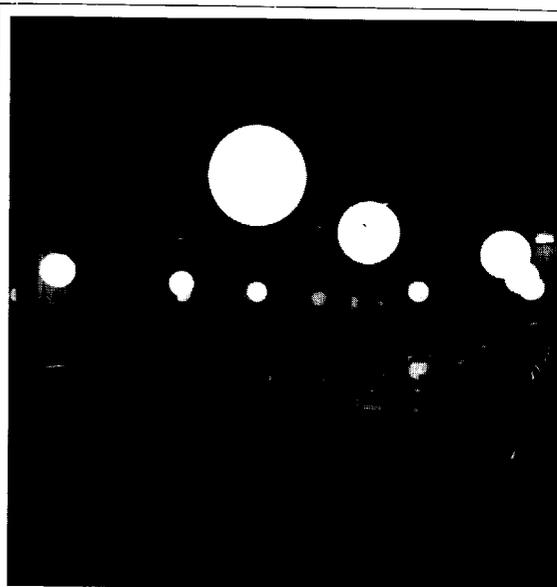
table 6.01				
Conditions	Design provisions		Situation	
Adjustment from bright to darker conditions	Time required about 30 seconds. Intermediary lighting zone (stepped lighting) preferable to reduce dark, gloomy impression. Larger spaces required. Steps and stairs avoided in area		Entrances from outside daylight to artificial lighting. Service from kitchen to restaurant	
From dark to bright conditions	Similar. Stepped up levels of lighting		Entrances: night-time use with bright interiors	
Contrast between bright area and background	2:1 barely significant 10:1 meaningfully significant 100:1 dominating and liable to distract		For displays, attractions and features. Over counters and bars stepped lighting	
Glare: excessive contrast causing discomfort or visual disability	Glare index limits 10 – critical 19 – good accuracy 28 – general work		Shielding of light sources. Sun shading. Avoidance of reflection from shiny surfaces.	
Intensities of light related to area and visual tasks	Entrances	Lux 200	Lm/ft ² 20	At tread level Bars, counters – 400 lux Tables – 200 lux Serving, cashier – 400 lux Assembly, decoration – 500 lux
	Stairs	200	20	
	Lounges	100	10	
	Restaurants	50–100	5–10	
	Cafeteria	150	15	
	Kitchen	300	30	
Age: visual acuity decreases	Age 40 – 10% loss 60 – 25% loss		Special situations such as hospitals, other institutions	
Field of vision	Foveal vision 2° for fine detail Near surround 30° for viewing objects' perspectives General comprehension 60° up to 70° down, spatial awareness Peripheral vision outside these angles		Signs, information Displays counters, room details, space, furniture arrangement. Lighting cues to attract attention	

table 6.02				
Requirements	Design provisions			
Screening from solar glare and heat	External canopies, awnings, internal blinds. Shade factors: 0.25 (awning) to 0.55 (venetian blind). Adjustable for changing conditions			
Distribution of lighting contours	Affected by width and height of window, angles of visible sky, light reflection from floor and lower walls. Maximum penetration about 4.5 m (15 ft)			
Daylight factors	Percentage of daylight	Minimum	Average	Supplemented
In UK based on standard overcast sky 5,000 – 6,000 lux	Cafeterias, dining rooms, kitchens, preparation areas	2%	5%	Below 1%
		3%	5%	Below 2%

6.03 Lighting in design

Artificial lighting is used as a feature of design and environmental interest as well as to meet functional requirements.

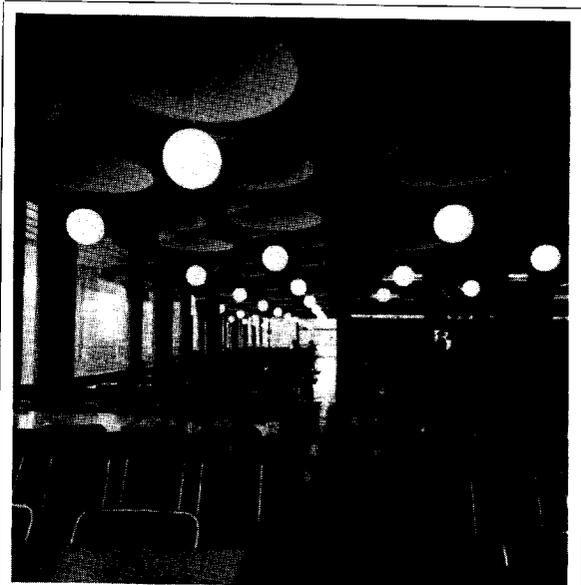
<i>Features</i>	<i>Design techniques</i>	<i>Examples</i>
Exterior or interior features	To emphasise architectural details Reveal or conceal spaces, Create patterns Indicate directions, hazards	Spot and flood-lighting Planes of lighting Directional illumination Specific, local sources
Variety	By varying intensity, positions, distribution, reflection and colour	Personalisation of areas
Vitality	Concentrations of light Background lighting Sparkle and reflection	Direct and spot lamps Dimmers and indirect sources Multiple sources
Orderliness	Luminaire patterns arranged to give sense of scale, direction, visual order	Luminaire design related to table plans
Novelty	Selective use of featured lighting. Visual clutter avoided	Designed luminaires
Emphasis (see section 4.01)	On near horizontal and vertical features, spatial background	Table and counter lighting window and wall lighting general diffusing light
Colour tones	Tendency to under estimate – noise and temperature – size and space	Bright light, cool tones Dim light, warm tones
Functional needs (see Chapter 8, section 7.03)	Intensity of illumination determined by installed rating, room area, utilisation and maintenance factors	Intensity at table height typically 0.2–0.3 times installed lumens
Sociability and warmth	Warm coloured fluorescent, or Tungsten filament lamps	De luxe quality 40W 75–150W bulbs



Personnel Restaurant, Cern, Switzerland

General lighting comprises 18 W SL lamps in glass bowl pendants and colour blended fluorescence lamps which show over 10 per cent energy saving.

Lighting equipment: Philips, Eindhoven

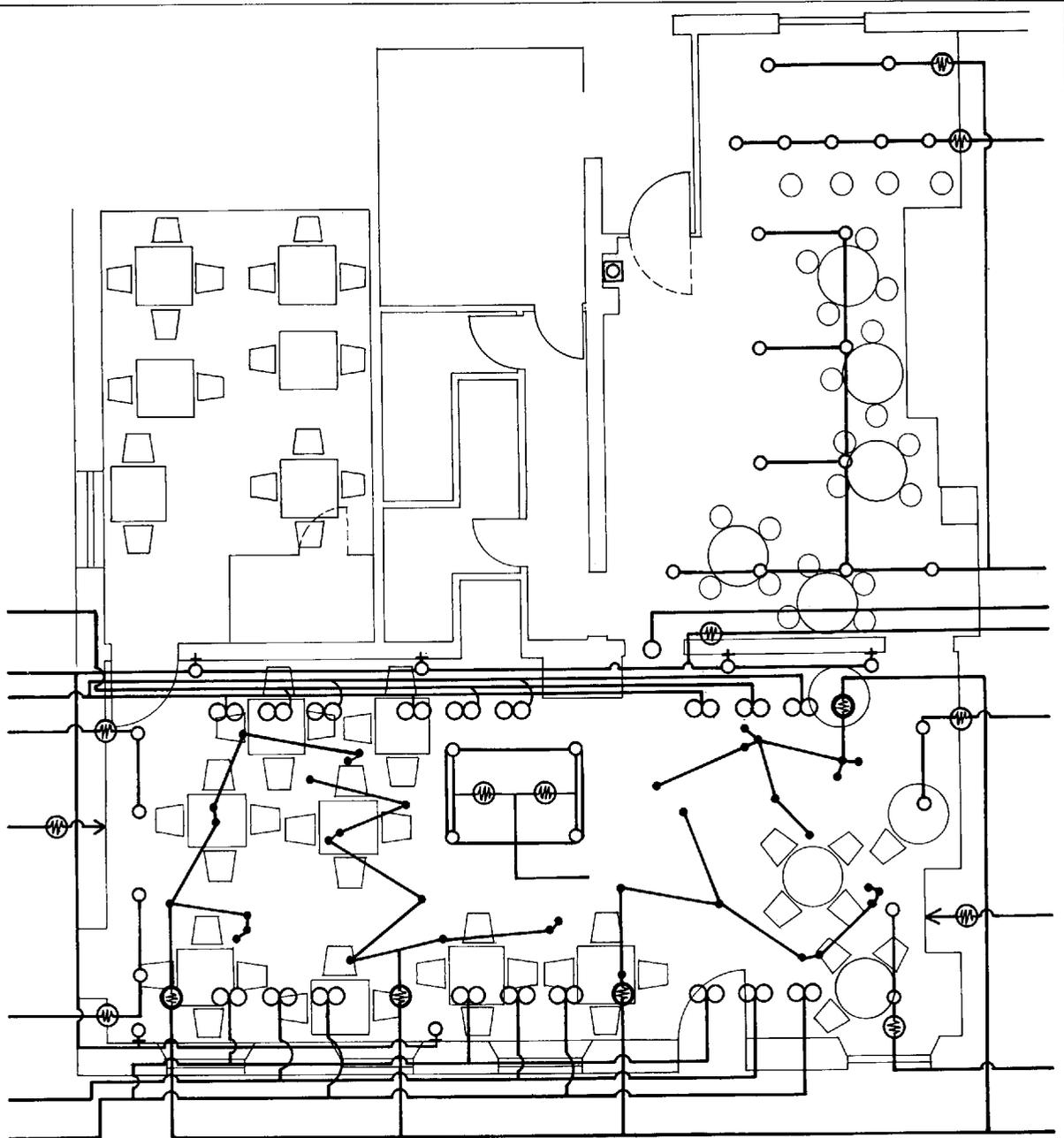


Gouda Sports Centre, Holland

Unusual but effective lighting scheme using glass bowl luminaires fitted with 25 W SL lamps having an equivalent light output to 100 W incandescent lamps.

Key

- ⊕ Transformer
100vA 12V
 - ⊕ Transformer
150vA 12V
 - ⊞ Control panel
 - Starlight
 - Light fitting
 - ⊖ Dual headed
spotlight
 - ♂ Wall light
- Separate circuits
with direct
supplies to light
fittings from
remotely
positioned
dimmer switches
(1.5 mm cable)
(Wiring from
transformers to
light fittings in
2.5 mm cable.)



Lighting

Lighting installation for Fifi's Restaurant, Colchester, designed as a Mediterranean quayside with dramatic changes in colour and atmosphere from midday (perimeter lumination) to night time (ceiling spots).

Designers: John Cullen Lighting Design Ltd



Ship Inn, Alveston

Use of low energy 2D 16 W compact fluorescent luminaires with a 5,000 hour life, five times that of incandescent lamps.

Lighting equipment: Thorn EMI Lighting

6.04 Colour in design

Colours in decoration affect the reflection and use of light in a room, the visual impression of space and other emotive responses.

Sources

- colour spectrum of the light source (affecting warmth and colour rendering of light),
- lamp-shades and screens (selective absorption of waveband of light transmitted). Used selectively in local areas with neutral tones (white, grey),
- colours used in decoration and furnishings (reflection of selective waves of light using dyes and pigments).

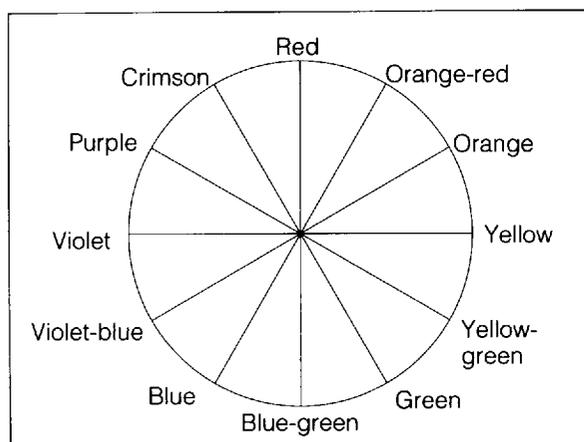
Terminology

- Hue: colour in the sense of red, blue, yellow, etc,
- chroma: saturation or intensity of colour expressed from 0 (neutral) to 16 (most intensive),
- value: lightness or reflectance value ranging from 0 (black) to 10 (white).

An effective wall reflectance of at least 30 per cent (Munsell value 6) is usually needed where the floor is very dark (to avoid gloominess) or where there are wide windows (to reduce contrast).

6.05 Colour relationships

The range of colours which forms the spectrum of white light may be represented as a circle to show relationships and effects:



6.06 Colour schemes

Many colours and combinations of colours are used in decoration but there should be some form of association between the colours to produce a comprehensive scheme. The following are examples of the main colour schemes:

(a) *Monochromatic*: one colour in different shades and tints with a neutral background or several shades of neutral with a single strong colour to accentuate. Tends to give a feeling of complete unity.

(b) *Complementary (contrasting)*: two colours from directly opposite sides of the colour circle. The intensities and areas coloured must be unequal so that one colour dominates. The effect is usually dramatic.

(c) *Split complementary*: similar combination but with a colour complemented by either or both colours adjacent to the one opposite. Any hue or neutral colour may be dominant, the others serving to accentuate.

(d) *Analogous or harmonious*: adjacent colours used together. A limited amount of complementary colour may be used for features. Creates a sense of unity but with wider range of colours.

(e) *Triad*: three primary, three secondary or three tertiary colours used together. For detail or accentuation, one colour is used intensely while the others are subdued by shading or tinting. Dramatic effects can be produced.

Although a wide range of shades and tones can be grouped together to impressive effect it is generally unsatisfactory to use more than three hues or colours. A mixture of intense colours tends to heighten tension.

Colours can be used with patterns to produce variations of light and dark shade.

On white cloths and chinaware colours produce tinting effects by reflection and must be carefully selected to blend with food served.

6.07 Psychological effects

Most colours tend to produce psychological responses by associations and the effects of each particular stimulation on the nerves of the eye. The subjective response will, however, depend on the individual.

Orange, yellow, red (sunshine, heat, fire)

- warm, active stimulating colours,
- tend to create a sociable atmosphere,
- advance surfaces, making a room look smaller, more intimate,
- tend to be strong colours and should be used in small areas,
- red tints are flattering to the skin (colour blended lamps),
- screened infrared lamps are also used for food displays (richness and warmth),
- the sensitivity of the eye to brilliant colours (such as red) quickly tires and visual fatigue then tends to distort other colours by emphasising those in direct contrast,
- bright colours are most suitable in premises with lively activity and high turnover (fast-food

units, snackbars),

— in other situations large areas should be toned down to allow small accents of colour.

Blues, greens (sky, grass, sea)

— cool, background colours (blues tend to be passive, weak colours),

— green is relaxing and refreshing,

— appear to make surfaces recede and emphasise spaces,

— less quickly and easily discerned and can be employed in large areas,

— should be in pure tones rather than grey shades,

— blues and greens are most suitable for hot climates and daytime use.

Red-blue

— violet is a heavy, cold colour with the opposite effect to yellow, producing a sensation of withdrawal and oppression,

— purple is more variable: it can be used for minor accentuation, richness of colour and dignity.

Neutral shades

— cream, grey and beige blend into the background,

— neutral shades are necessary to contrast with intense colour highlights,

— with careful blending neutral shades can suggest simplicity and elegance,

— white is the colour of purity, cleanliness and order; it plays an important role in separating colours and giving them vitality,

— white can be combined with bright, clear colours for freshness and liveliness (gingham, red, yellow, green).

Special effects

— focal points of interest and air of theatricality can be introduced by use of stained glass, coloured mosaics and reflection from metallic colours (in bars, lounges),

— features can be emphasised by spot and directional lighting to add sparkle and animation,

— for entertainment stage lights and lasers can be computer controlled to blend and modify colour and direction in programmed sequences.

6

Construction and Services

1. Doors and windows: entrance design

1.01 Entrances

Requirements for entrances are detailed in Chapter 4, sections 1.13–1.15. In addition to providing for convenient ingress and egress – including fire-escape requirements – entrances serve a vital merchandising role (providing identity, views of interior, reassurance of standards). The main entrance and its surrounds are subject to close scrutiny and evaluation. Standards of quality (of construction and door furniture) and maintenance are critical.

1.02 Internal doors

The number of corridors and doors should generally be kept to a practical minimum. Space should flow from one area to the next with circulation planned through usable, preferably revenue-producing, lobbies, lounges or food-service halls.

Restaurant seating areas may be separated by partial screening (glass panels, trellis and planted containers). For intensive traffic, public and service entrances may be left open with screening to reduce noise and visual intrusion.

Key requirements include:

- *function*: internal doors may be required to provide privacy and security, to reduce noise entry or draughts, for fire or smoke separation, regulation of air conditioning, and separation of functional areas,
- *legal conditions*: specific requirements may apply, such as the separation of areas used for sale of alcoholic drink (licensing), fire resistance and means of escape in event of fire (see section 7.07 and Chapter 4, section 1.15), safe public ingress and egress,
- *width*: for public circulation: 840–914 mm (33–36 in.) single-leaf doors or up to 1500 mm (60 in.) for double doors. Height usually 2130 or 2430 mm (84 or 96 in.). The arc of swing must be clear of landings and waiting or assembly areas,
- *construction and style*: similar to main entrance with repeated motif or logo. Interior visible (except for private dining and function rooms). Menu displayed adjacent,
- *service doors*: separate single swing, in and out doors usually necessary for service circulation. Minimum width 750 mm (30 in.). Double doors with two-way swing (fitted with shatterproof viewing panels) may be required for trolleys. Automatic sliding doors advantageous in limited areas,

table 1.03

Considerations	Details																					
Large sheets of glass	Avoidance of glazing bars allows the exterior to flow into the room. The decor should be complementary to the setting Produce less directional emphasis than windows which are divided into small panes If extended down to floor level, tend to draw attention to the flooring and extend the spread of the area to the outside (patio, terrace, lawn, etc) A buffer rail may be provided at table height, 750 mm (30 in.)																					
Draped curtains	Draw attention away from the size and placing of the window and become a prominent feature of the interior design																					
Solar heating	Glass in common use is transparent to wavelengths over the spectrum 0.3–4.8 μm which includes most of the radiation from the sun but opaque to the longer wavelengths of radiation at lower temperatures – below about 230°C (450°F) – creating a 'greenhouse' effect (see section 5.10)																					
External blinds or shutters	Tend to characterise the building's appearance and may be used as a promotional feature																					
Internal blinds	Have a strong influence on room design Decorative mesh curtains may be used to soften impact																					
Double glazing	May be required for noise insulation (airports, highways) or for thermal insulation (Building Standards)																					
	<table border="1"> <thead> <tr> <th colspan="3">Minimum space between glass</th> </tr> <tr> <th>mm</th> <th>in.</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>100</td> <td>4</td> <td>250 mm (10 in.) better</td> </tr> <tr> <td colspan="3">For traffic noise</td> </tr> <tr> <td colspan="3">For thermal insulation:</td> </tr> <tr> <td>2.84W/m²°C (0.5 Btu/ft²h°F)</td> <td>19</td> <td>¾ air space</td> </tr> <tr> <td>3.34W/m²°C (0.6 Btu/ft²h°F)</td> <td>6</td> <td>¼ vacuum space</td> </tr> </tbody> </table>	Minimum space between glass			mm	in.	Notes	100	4	250 mm (10 in.) better	For traffic noise			For thermal insulation:			2.84W/m ² °C (0.5 Btu/ft ² h°F)	19	¾ air space	3.34W/m ² °C (0.6 Btu/ft ² h°F)	6	¼ vacuum space
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For thermal insulation:																						
2.84W/m ² °C (0.5 Btu/ft ² h°F)	19	¾ air space																				
3.34W/m ² °C (0.6 Btu/ft ² h°F)	6	¼ vacuum space																				
Opening lights	Windows sealed for air-conditioned space For natural ventilation, high-level, top hung lights are required to avoid draughts Access provided for external and internal cleaning																					
Condensation on glass	Perimeter heating with directional airflow to balance temperature variation. Drainage channel considered																					

- *durability*: resistant to impact (trolleys), kicking and hand marks. Decorative guards may be fitted,
- *noise reduction*: heavy construction with self-closure devices (adjustable) and impact absorbing edges,
- *draughts*: local seating may be affected by inflow of air from entrance or extract through service doors. Balancing or baffling provided.

1.03 Windows

Window design has a major influence on the planning of interior space (see table, p. 120).

2. Walls, partitions and ceilings

2.01 Interior walls and partitions

Constructional features of interior walls and partitions are outlined in table 2.01.

Movable and relocatable partitions are used mainly in private dining rooms and multi-purpose halls to allow changes in room size and function.

2.02 Main problems associated with lightweight construction

Measures must be taken to reduce damage to lightweight constructions (see table 2.02).

2.03 Wall surfaces

Various types of surface finish include:

- exposed construction or applied tiling and slab finishes,
- plastered surfaces forming a base for decoration or wall coverings,
- dry-lining with sheeting or boarding materials.

2.04 Constructional materials, tile and slab finishes

The main types of finishes are summarised (table 2.04):

table 2.01		
Type	Construction	Comments
Load-bearing walls	Brick, block or monolithic concrete construction; plastered or lined	Requires arch, lintel or beam support over openings
Non-load-bearing. Fixed partitions	Lightweight blocks, slabs or studding	Alterations involve building work and making good
Demountable partitions	Framework or studding covered with sheeting materials	Can be dismantled for alterations
Relocatable partitions	Self-supporting panels jacked against ceiling and floor	Ceiling may need strengthening. Can be moved elsewhere
Movable screens and partitions	Free-standing or mounted on rails and tracks	May be folding, hinged, sliding, with double or single leaf

table 2.02		
Defect, etc	Cause	Prevention
Cracking, particularly at junctions	Unequal dry shrinkage, thermal movement and vibration	Reinforcement or deliberate provision of flexible joints
Structural damage	Vibration due to door slamming or movement	Stiffening and securing
Surface damage	Impact – e.g. by trolleys, chairs, furniture, mobile equipment	Provision of fenders, skirtings and stronger sheeting in areas affected
Inadequate support	For wall-mounted appliances, shelving, fittings and equipment, e.g. in kitchen, counter area, cloakroom, etc	Strong framework where required. Pre-planned layout to position supports
Noise penetration and resonance	Limited weight and rigidity and difficulty of sealing joints	Special treatment applied – resilient linings and packing. Noise absorption may be provided

Material	Main characteristics	Examples of use
Exposed masonry (brickwork, stonework)	Carefully selected and constructed to fine finish. Texture may be emphasised. Liable to be stained (difficult to clean). May be softened by hung screens, tapes, tries. Tends to dominate character	Featured construction (fireplaces, arches window reveals). Stairs, terraces. External and internal landscaping
Polished marble. Terrazzo	Sawn and polished slabs or tiles and inlays. Expensive. Hard-wearing and impressive looking but liable to be noisy and cold. Softened by drapes	High traffic areas, food halls, entrances, staircases, door and elevator openings
Glazed ceramic tiles. Mosaics: glazed ceramic, marble and glass tesserae	Wide variety of enamelled colours, patterns (underglazed) and sizes. Gloss or matt finish. Modular tiles: 100 × 100 × 5 mm 200 × 100 × 6.5 mm Mosaics may be pre-assembled on mesh backing	Walls, partitions, and counters in serveries and foodhalls. Hand-made tiles or mosaics may be featured in Italian and Spanish restaurants
Decorative glass panels, screens, mirrors	Coloured, transparent, opaque or obscured glass in decorative screens and wall panels. Mirrored glass in frames, sheets or tiles. A variety of surface and edge treatments can be applied and reflection/refraction emphasised by concealed perimeter lighting	Wide range of uses in ballrooms, cocktail bars, dining areas, toilets. Mirrors create illusions of space (to correct room proportions) and add to brightness, animation and interest
Glass blocks, coloured leaded lights	Similar effects. Custom designed in screens and self-supporting partitions	For decorative screens and windows, bars, discos

The method of fixing lining and cladding materials will depend on such features as the unit size, thickness, weight and surface keying. As a rule, small lightweight tiles are secured by adhesive or cement mortar on to an even rendered surface, while larger sheet and slab materials may require cramps or brackets.

2.05 Plastered surfaces

Plastering gives a wall the smooth surface necessary for successful painting or papering. Lime or gypsum plaster may be applied direct to structural wall surfaces or to a foundation mesh of lathing (metal, wood or plaster board).

Alternative finishes to a level surface include stippling, brushing, impressing textured materials or rollers and forming raised decorations or surface mouldings. The use of patterned or moulded finishes limits subsequent decorative treatment to painting.

2.06 Board, sheet and slab materials

Sheeting materials are extensively used in interior construction work for:

- wall linings and finishes,
- ceilings and canopies,
- partitions and screens,
- counter units, shelving, benching, panelling,
- furniture construction.

Particular advantages arise from the speed of construction, assembly and adaptation and the

wide choice of materials and composites available.

Methods of fixing depend on the underlying construction as well as the type of sheeting:

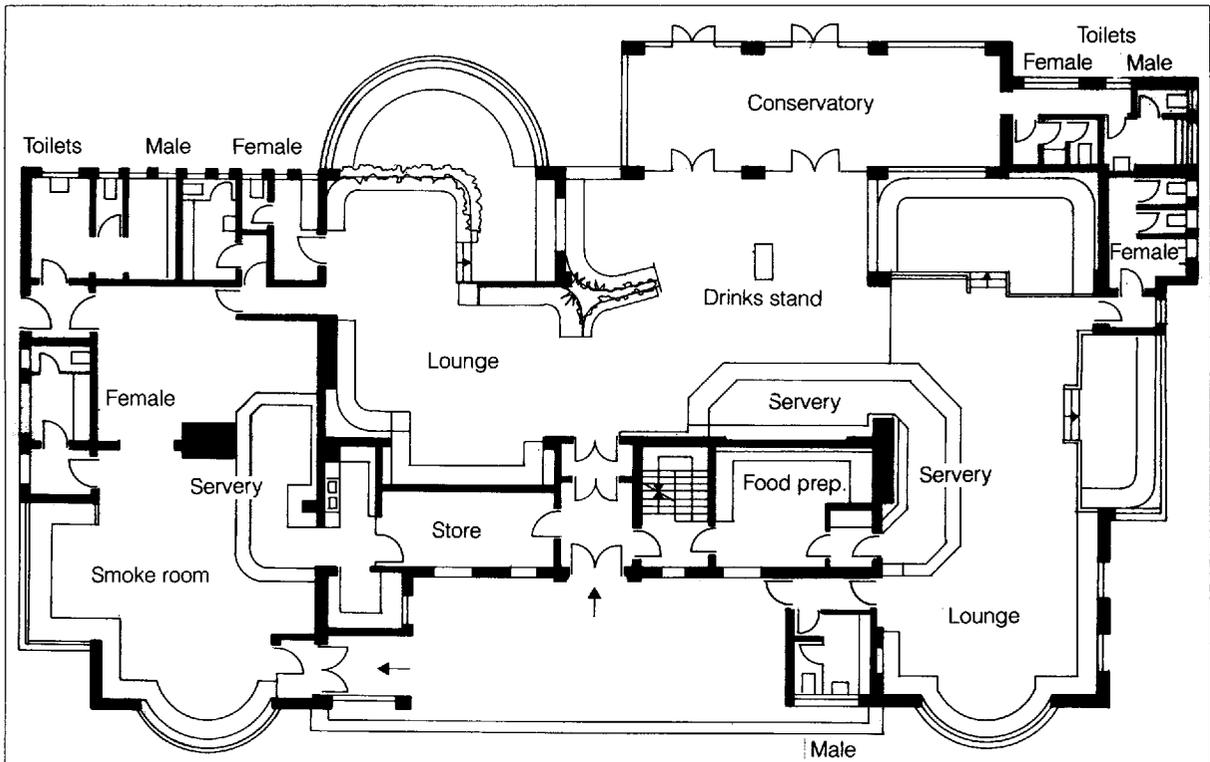
- direct fixing to smooth, dry surfaces by adhesives,
- securing to a framework of battens, studing, joists, etc (timber, steel or aluminium).

Provision must be made for stabilisation and for differential movement (moisture, thermal, settlement) with covered or open joints.

2.07 Selection of lining materials

Depending on the intended use and situation, consideration should be given to physical properties, such as suitability of appearance, need for decoration and cleaning, hygiene (should be non-absorbent), durability and resistance to damage, initial cost and time and scope for future modification.

- *strength*: tensile and flexural strength for suspended sheets; impact strength for wall linings and counter surfaces, etc; modulus of elasticity,
- *abrasion resistance*: to scratching and scraping (e.g. by trays) and effect on appearance – this applies to surfaces of walls, partitions, counters, tables,
- *dimensional stability*: coefficient of thermal expansion, dry shrinkage movement and effects of moisture and humidity change. Most important in kitchen, servery and toilet areas,
- *resistance to oils, water and chemicals*: in all



Ground floor Internal alterations



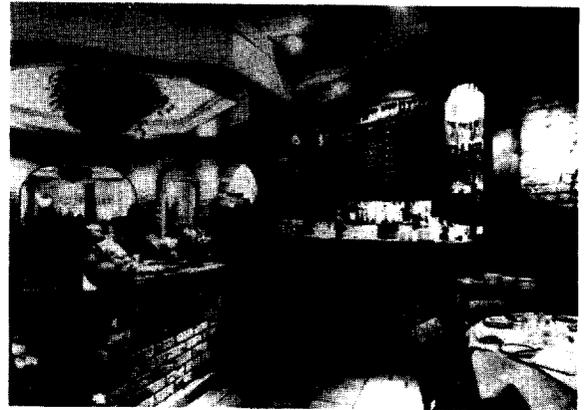
Chained Bull, Leeds

Converted from a 1920s roadhouse pub, some 80 per cent of the premises has been designed as an upmarket bar for the 18–35 year age group. The lighting and sound systems are sophisticated to create different moods and effects from day to evening. A conservatory has been added to extend the drinking area.

The remainder of the premises has been kept as a separate traditional pub design with a Victorian club atmosphere.

The pub also provides a barbecue, beer garden, drinks' terrace, children's play area and a large car park.

Development: Joshua Tetley & Son, a division of Allied Breweries



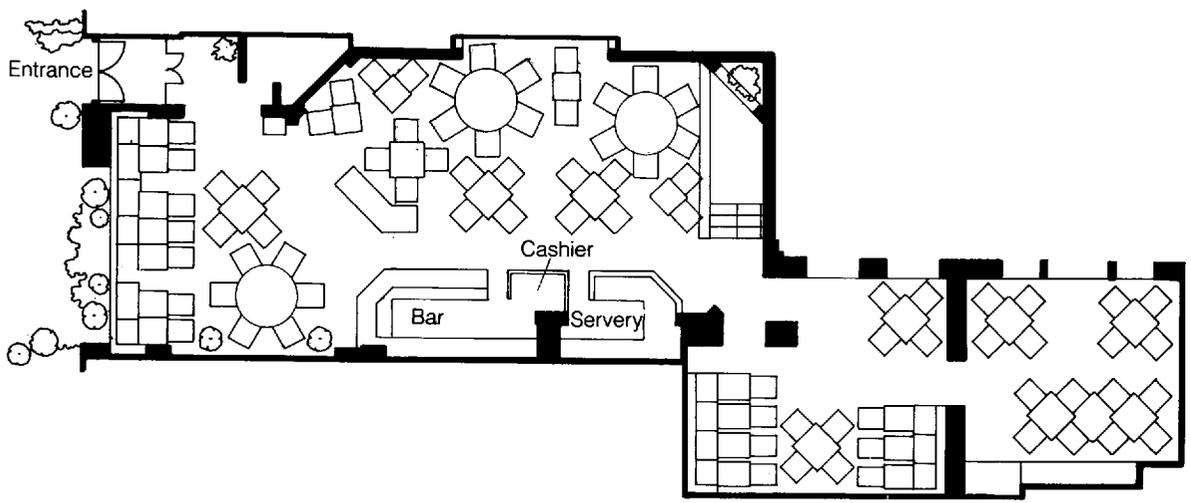
Relais des Amis, 17 Curzon Street, London W1

Formerly Cunninghams, a traditional fish restaurant which operated here for 18 years, Relais des Amis caters for a wealthy Mayfair and North London market.

The client wanted to combine a Provençal air with the urbanity of a smart New York restaurant called At the Sign of the Dove. Second-hand bricks and beams, and the terracotta floor tiling were all introduced to obtain this effect. The dummy rooflight has a lighting system which creates differing moods for day and night trading. Mirrors and planting give an illusion of

space and depth (a). Food service is via the staircase from the basement kitchen in the traditional French manner, while drinks are served from the bar which doubles as a wine dispense (b).

Clients: Activemill Ltd
 Designers: Carmona Dover
 Main contract value: £84,000
 Furniture and furnishings: £16,000
 Equipment: £10,000
 On site: 18 weeks



areas exposed to contact with food and requiring frequent cleaning. Includes the possibility of absorption, staining, erosion, decomposition or decay, corrosion and retention of dirt,

— *resistance to heat and fire*: in proximity to cooking, holding or heating appliances; fire resistance may be of critical importance in separating walls and ceilings, corridors and staircases. The rate of surface flame spread requires special consideration.

— *insulation*: thermal or sound insulation may be of primary significance, for instance in partition and ceiling constructions.

2.08 Paintwork and decoration

Paint is applied to building finishes for a variety of purposes, to enhance appearance, produce colour decoration, increase resistance to moisture absorption or loss, stabilise dimensions, provide fire retarding, corrosion resistance and other properties.

The quality of the finished appearance will depend on the condition of the surface and the preparation (priming, sealing, knotting, filling, etc). In food premises, non-toxic, grease and moisture resistant, anti-fungal and non-leaching properties are important, as well as ease of cleaning or renewal.

2.09 Examples of paints in common use

2.10 Wallcoverings

Wallcoverings in the form of thin, flexible sheets, include a wide variety of materials, decorative patterns and colours and surface textures. The cost is relatively low and replacement easy, allowing the decor to be changed after a relatively short life cycle. Wallcoverings usually have to be protected against damage or soiling (by positioning or barriers).

2.11 Wallpapers

The standard dimensions of British wallpapers are 530 mm (21 in.) wide × 10 m (33ft) long. The more common papers for commercial use include:

- vinyl wallcoverings: PVC film on paper or fabric backing,
- relief and textured papers (anaglypta, lin-crusta, flocks),
- period and reproduction papers (chintz, damask),
- metallic papers printed in metallic powders,
- silk, fabrics, woven grass and cork laminated on to paper backing.

2.12 Wall-hung panels

Panels constructed of a surface material mounted and bonded or laminated on to a solid core, or ply, block particle or fibre board. The panels are hung

table 2.09

Type of paint	Composition summary	Uses
<i>Solvent thinned</i>		
Oil bound	Alkyd and other resin – oil binders with a drying solvent and pigment (including polyurethane and silicone alkyd gloss paints)	Durable, semi-flexible wearing surface with gloss, semi-gloss or egg shell finish. Normally used with undercoat
Varnishes	Clear coatings without pigment. Usually polyurethane based	For protecting and enhancing the natural grain and colour
<i>Special</i>		
Chlorinated rubber	Rubber emulsified with plasticiser and solvents	Resistant to moisture, oils and acids. Impervious coatings in kitchens and stores
Lacquers	Cellulose with plasticisers and resins with stain pigment or metallic lustre	Spray applied to furniture and cabinet work and for decorative metallic finishes
Flame retardant	Films of oil and emulsion paint treated with antimony oxide and chlorinated or brominated compounds	To upgrade fire-rating of wood and similar products
<i>Water thinned</i>		
Plastic emulsion	Pigmented suspension of copolymers or terpolymers in water. PVA/acrylic and styrene/acrylic copolymers are common	Wall paints with vinyl, silk and matt finishes. Textured for outdoor use
Cement	White or coloured cement base. May have added texture	Porous cement, etc, for walls to improve colour freshness
Multi colour	Suspensions of paint globules in spray medium. Usually emulsion based	For speckled effects. Hard wearing for cloakrooms, WCs, etc

on timber or aluminium battens to give an even surface. Provision should be made for movement, jointing and balancing to prevent distortion. Examples of panels include:

- melamine laminate, using melamine and phenolic resins compressed with decorative paper transfers. A wide variety of designs (including corporate symbols and surface textures are available,
- polyester resin, lacquered boards with textured coloured finishes and effects,
- leathers, vinyls and woven fabrics, mounted on panels, sometimes with foam backing,
- metal sheets and foils with patterns and designs,
- glass panels with etched, engraved, tinted and mirrored glass work (see section 2.05).

2.13 Ceilings

If the room is reasonably high, the ceiling is usually the least prominent interior surface in a restaurant. People entering a restaurant or seated at a table seldom raise their eyes more than 10° or 15° above normal eye level except for a specific purpose, such as reading an elevated menu or speaking to a waiter.

Ceilings are, therefore, mainly functional in design, serving to house and hide engineering services and terminal equipment. The type of ceiling construction suitable for a restaurant, bar, kitchen, corridor, etc. will depend on:

- *engineering services*: size and design of ducting, cables, etc,
- *terminals*: diffusers, grilles, recessed and suspended fittings,
- *acoustic requirements*: sound absorption and insulation,
- *fire-resistance and surface flame spread*: see section 7.01,
- *thermal insulation, condensation and effects of moisture*,
- *dismountability and access*: for working and equipment removal,
- *constructional features*: weight, support, finish,
- *decoration and maintenance*: finishes, cleaning, staining,
- *cost comparisons*.

Particular requirements for kitchens are outlined in Chapter 8, section 6.03.

2.14 Types of ceilings

There are two types of ceilings: (a) those applied direct to the underside of structural components of the building (structural floor or roof construction) which are used where headroom is restricted (mezzanines, basements) and where services can be housed in ducts, bulkheads or service tunnels;

and (b) suspended ceilings supported on a framework (wood, aluminium, steel) hung below the structural floor or roof. The ceiling void may be used for services. Ceilings may present a finish either without joints or formed from panels (tiles), strips or open grids. Jointless ceilings consist of plaster applied to plasterboard or metal lath.

Decorative features (mouldings, architraves, embossing) may be applied. They are suitable for small rooms of traditional design. Access panels may be required for covered services.

Jointed ceilings, however, provide access and can incorporate modular fittings and services as an integrated system.

Type of ceiling	Features
Jointless	Usually plaster based, weighing about 50–60 kg/m ² (10–12 lb/ft ²). May include membrane ceilings with stretched plastic or fabric membranes suspended across the areas (permanent or removable)
Panel or frame and tile.	Panels or tiles to modular dimensions; 600 mm, 300 mm (24–12 in.). Average weight about 5–15 kg/m ² (1–3 lb/ft ²). Panels may be mineral fibre, metal lay-in trays, open gridded, translucent
Linear strip	Metal (most common), wood or plastic strips requiring cross support only. Weight about 2.5–5 kg/m ² (0.5–1 lb/ft ²). Strips jointed with flush or grooved joints. Usually backed by mineral wool infill. May be perforated for sound absorption and air diffusion
Services integrated	May incorporate modular light fittings or light track, air diffusers or slatted/perforated ventilating panels, modular sound speakers, fire alarm and sprinkler systems, electric trunking and flexible conduct connections. Ventilating ducting may be enclosed, with V or U shaped distribution channels or combined with the ceiling void. Light fittings may be separately ventilated to extraction ducts to remove heat
Noise insulated	Ceiling panels may be acoustically absorbent or perforated with an absorbent backing. Absorption should be balanced over the range of frequencies
Thermal insulated	Ceilings backed by mineral fibre or reflective foil. A vapour barrier must be provided below the insulating layer

Fire resistant	(a) Fire-resistance of overall construction: ½ to 2 hrs* (b) Surface flame spread Restaurants and public rooms <i>Limiting class</i> One generally: small areas up to 2.5 m ² may be two or three if separated by 3.5 m Exit routes (stairs, corridors) and Food production areas should be 0 or incombustible*
Fire controlling	Automatic sprinkler systems may be installed in high-risk areas (corridors, staircases, foyers, public places)

* See tables 7.05 and 7.06 for details.

3. Floors and floor coverings

3.01 Requirements

The floor of a restaurant or bar must be both decorative and functional, and in keeping with the character and intensity of use of the area.

Considerations:

— *sub-floor*: nature and condition of the underlying construction. The surface may need to be screeded to provide level uniform support. A damp-proof membrane may be required (ground floor, adjacent damp conditions). Access needs to sub-floor services may restrict the choice of flooring (edging, damage).

— *appearance*: in relation to the use of the room, resistance to traffic, wear, spillage of food, liquids, grease, stains, and indentation. The importance of retaining a smart appearance, routine cleaning and maintenance requirements

should also be considered,

— *noise, warmth and comfort*: related to the softness and resilience of the floor surface and the decor of the room,

— *slipperiness*: may be important in circulation areas (serveries, stairs, entrances), particularly where wetting or spillage may occur (water, grease),

— *durability*: resistance to damage and wear related to the anticipated life of the floor. A permanent flooring, although durable, might restrict ease of refurbishment in the future.

Food production and ancillary areas are considered in Chapter 8, section 6.05. Details of steps and stairs to meet typical fire escape requirements are summarised in Chapter 4, section 1.15

3.02 Floor finishes (see table 3.02)

3.03 Carpets

Carpeting is used for the majority of restaurants, lounges and bars. Its attractive, varied appearance, texture, warmth, ability to reduce noise and softness create a sense of comfort and luxury. Routine cleaning is facilitated by regular vacuuming.

Carpets may come in two categories:

(a) Woven, with the surface yarn and backing woven together. Different weaves produce Wilton, Cord, Brussels, Axminster and oriental-type carpets.

(b) Non-woven; in which the base is woven first and the pile subsequently inserted (e.g. by needles or electrostatic flocking) and held in place by bonding compounds (PVC, latex).

Type	Composition and main characteristics	Main uses
Flexible PVC sheets and tiles	Plasticised, polyvinyl chloride resin with fillers, extenders, pigments and stabilisers. May be backed with base materials, printed to provide special effects and embossed or textured. Marks disguised by pattern. Easily marked by cigarette burns and sharp objects	Cafeteria serveries, snack bars, fast-food units. May be used for circulation with carpeted seating areas
Hard tiles, stones	Decorative quarry and ceramic tiles with non-slip matt surfaces. Natural or reconstituted stone flags (slate, sandstone, marble)	Coffee shops, speciality restaurants
Wood block, board and strip flooring	Blocks laid in decorative patterns, including parquet and parquet composite floors. Strip and boarded floors may be provided in multi-purpose sports halls, dance halls. Carpet strips or covering may be provided for protection. Requires regular maintenance, repolishing. Easily damaged by burns, indentation and marked by spillage	Multi-purpose halls, institutions, banqueting halls (carpet-covered), dance squares (permanent or removable)

table 3.03a	
Considerations	Characteristics
Dimensions	<p>Body carpet is usually available in widths of 685 mm (27 in.) 910 mm (36 in.) or 1 m (39.4 in.)</p> <p>Broadloom comes in 2, 3, 4 or 5 m standard widths (6, 9, 12, 15 ft.), depending on manufacturer</p> <p>Tiles are 400 mm, 500 mm and 1 m squares (16, 18, 39.4 in.) and a tolerance of \pm 1.25 per cent is allowed under BS 3655.</p>
Appearance	<p>Small, repeated patterns with muted colours are generally most practicable</p> <p>Large, bold patterns may feature in halls and central areas where they are not obscured by furniture</p> <p>Dark, strong colours tend to show dust and fluff, and light colours improve reflection but may show soiling, burns, etc.</p> <p>Geometric patterns may emphasise unevenness and wear.</p> <p>Uniform colours are generally unsuitable unless strongly textured (carpet tiles)</p> <p>The colour fastness of the yarn is also important</p>
Yarn	<p>The type and quality of the fibre largely determines the properties of the carpet (see below)</p> <p>The yarn may be woven into a velvet pile, which tends to show tracking, or heated to form a harder twist, which may felt in time.</p>
Pile	<p>The quality of a carpet is indicated by:</p> <ul style="list-style-type: none"> pile density: pitch or number of tufts per unit area, pile weight: weight of yarn in grammes/m² (ounces/yd²), pile length: thickness of pile yarn. <p>For commercial use a short, thick pile is preferable for a longer life, to avoid snagging and maintain appearance.</p>
Backing	<p>Good backing will help keep the shape of the carpet. It may be cotton, linen, jute, polyester or polypropylene, depending on the pile.</p>
Laying	<p>Careful laying is important for avoiding distortion, folding, fraying and uneven wear.</p> <p>Carpets are normally power stretched and secured by tackless grippers at the edges and with edging in doorways</p> <p>Carpet sections may be stitched or seamed with backing tape. Wearing and the degree of insulation a carpet provides will depend on the quality of the underlay.</p>
Weaves	<p>For commercial interiors the main weaves are:</p>
patterned Wilton:	<p>pile yarns in two or more colours woven into the back, giving a dense, close pile with small, repeated patterning</p>
Axminster:	<p>individual pile yarns inserted into the backing allow a greater variety of patterns</p>
Oriental:	<p>Persian, Turkish, Indian and similar carpets have a characteristic pile knotted to the back. Used mainly in screen or wall coverings</p>
Non-woven, tufted and flocced	<p>Pile inserted by needles (needle felt) bar, spray or electrostatic (flocced) processes.</p> <p>May have strong directional textures or patterns. Mostly in synthetic fibre.</p> <p>High-density flocced pile on a waterproof base can be used in severe conditions</p>
Standards	<p>General contract – for restaurants, lounges, corridors</p> <p>Heavy contract – for public areas, heavy traffic</p> <p>The wearability of a carpet is measured by rubbing tests using a standard rubbing machine.</p>

<i>Pile fibres</i>	<i>Characteristics</i>
Wool	Natural fibre, highly resilient, moderately hard wearing and resistant to soiling. Does not readily ignite and burns are self extinguishing. Static electricity generated only in very dry atmosphere (below 40 per cent RH). Acts as a good insulator. Liable to be attacked by moth and carpet beetle unless treated with insecticide. For better wearing, often blended 80/20 with polyamide
Animal hair	Naturally coarse and stiff, producing a tough hard-wearing pile with distinctive shading effects. Used mainly in carpet tiles
Polyamide (nylon, Timbrelle, Enkaslat, Antron)	Tough abrasion-resisting fibre with low moisture absorption. Tends to attract dust and stains but is relatively easy to clean. Low melting point, easily damaged by burns. Lacks the softness and resilience of wool. High static generation even at high relative humidities up to 60 per cent (anti-static treatment possible). A blend of wool and polypropylene increases durability
Polyacrylic (Acrilan, Cour-telle)	Similar characteristics to wool but not as soft and liable to be damaged by burns. Stains easily but the fibres are non-absorbent and easily cleaned. May be used alone or 80/20 with polyamide.
Polypropylene (Meraklon)	Lightweight and durable. Resists stains and cleans easily. Non-absorbent and rot-proof, may be used in damper areas with an appropriate synthetic backing. Low resilience, does not retain texture well. Melts under heat. Often combined with polyamide 60/40–85/15
Polyester (Terylene)	Soft and strong although not as resilient as wool. Liable to damage by heat and oil stains. Used in some upholstery fabrics
Viscose (Rayon)	Inexpensive but neither resilient nor durable. May be used in blends but is generally limited to domestic grades and less exposed fabrics

4. Noise insulation and acoustics

4.01 Standards

Acceptable noise levels in a restaurant or bar will depend on the type of establishment, its situation and the circumstances involved. Sounds generated within the room (movements, activities, conversation) provide reassurance and a social atmosphere as well as masking noise to some degree. Noise control is necessary if it is distracting or annoying and drowns speech. To some extent a high level of background noise in a large cafeteria or restaurant is self-aggravating: it makes people speak louder in order to be heard.

4.02 Speech interference levels

Sounds most liable to interfere with speech fall within the octave bands with centre frequencies 1,000, 2,000 and 4,000 Hz. To be heard clearly the level of speech must be about six decibels higher than background sound in these frequencies. Approximate decibel levels of speech over a distance of 1 m are: intimate conversation 44–69 dB, normal speech 50–70 dB, raised voice (groups) 56–81 dB.

Other factors which affect the tolerance levels of background noise include the situation (urban or rural), time factor (midday or evening) character of noise (pure tone or mixed) repetition (frequency) and conditioning (familiarity of noise.)

4.03 Standards

Background levels are expressed as noise rating NR – or noise criterion (NC) curves measured over octave bands with centre points from 63 to 8,000 Hz (allowing for greater sensitivity at the higher frequencies).

<i>Situation</i>	<i>NR or NC</i>
Cafeterias, gymnasias	45
Large restaurants, bars, nightclubs	40
Small restaurants, cocktail bars	35
Private dining rooms	30
After-dinner speeches, conference halls	25

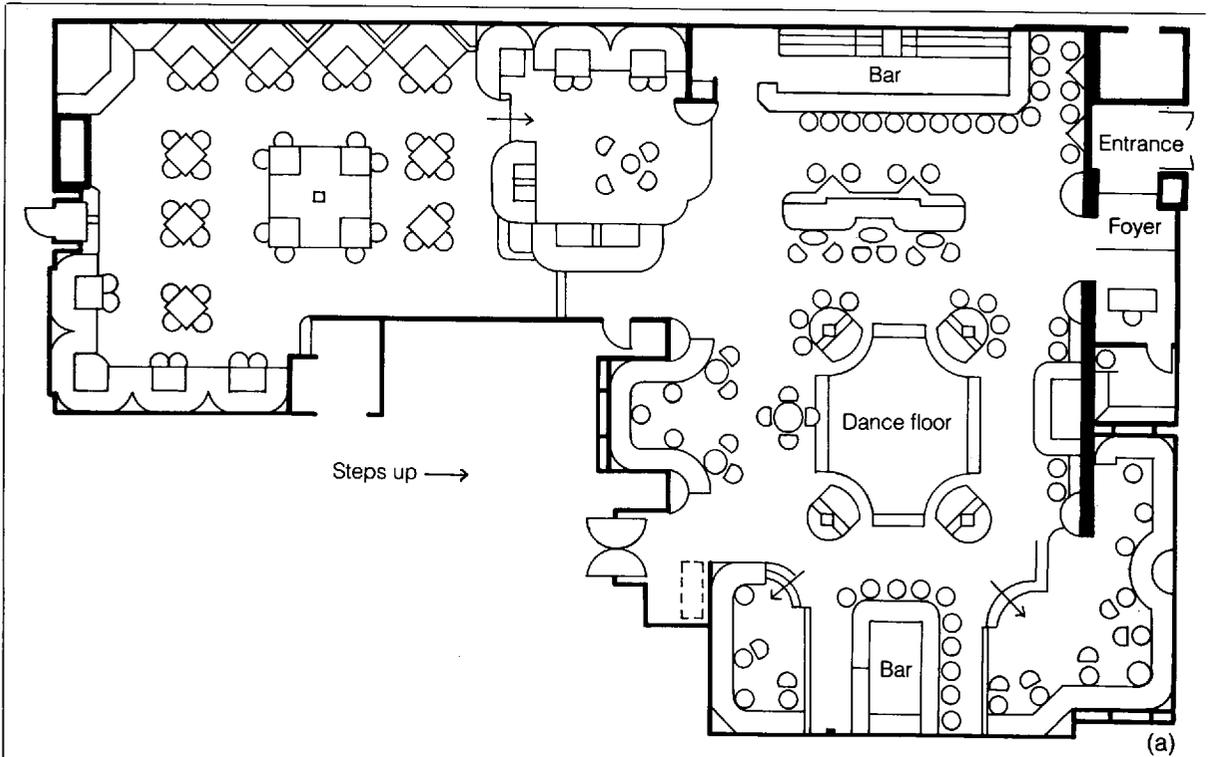
Represents dB reading at 1,000 Hz. Equates to weighted dBA minus 5 or 6.

4.04 Impact noise

Impacts between hard contacting surfaces may produce high peaks of noise and vibration.

Control involves:

- provision of resilient surfaces (carpets, vinyl covering) and meeting edges (strips and buffers),
- damping down vibrations with resilient backing (under flexible counter tops),
- reduction of turbulence in air and water flows (design of air ducts and terminals).



Boccacio, Houston, Texas

Boccacio is a private club/restaurant with space flowing between the dining and lounge/dance areas (a). The designer, Lynn Wilson, has carefully arranged the seating, with changes in levels, to allow visibility and a choice between semi-private niches or 'break-away' spaces (b). The theme of elegance with touches of Art Deco is continuous throughout the whole area and the architecture and built-in furnishings are carefully blended (b).

For acoustic control, the walls and banquettes are covered with mohair fabric in addition to stepped and coffered ceiling treatment.

Lighting is used to differentiate between areas and recessed spotlights and washes create dramatic light and shadow effects (c).

The project was completed in 5 months.

Interior designers: Lynn Wilson Associates

(c)



(a)



(b)

4.05 Sources of noise

In addition to noise generated within the room, the most irritating sources of noise are:

- external: road traffic, aircraft, railways,
- adjacent: food production and dishwashing activities (see Chapter 8, section 7.04),
- equipment: air-conditioning and ventilating plant, discharges.

4.06 External noise

Noise in urban areas depends on the particular situation, distance from the road (or source) and extent of screening. Average daytime levels of traffic noise are typically:

Situation	dBA 10–90%
Arterial roads, very heavy traffic	80–68
Major roads, heavy traffic	75–63
Shopping areas with local traffic	70–60

4.07 Sound insulation

External noises entering a building may be airborne or caused by structural resonance, including low frequency vibrations.

Airborne noise intrusion may be reduced by tightly fitting or well-sealed windows, screened entrances or lobbies with absorbent linings, sensible positioning and design of ventilators and the sealing of flanking paths (through ceiling voids, etc).

Structural resonance is limited by increasing the mass or weight, separating the inner and outer components and absorbing resonance with a lining of resilient material. Certain points require consideration:

- the sound insulation of solid building structures increases by approximately 5 dB for each doubling of weight (i.e. thickness) and frequency (i.e. per octave),
- separation of inner and outer leaves is most effective if connections across the cavity are flexible; the width of the cavity is related to the wavelength of sounds – minimum 50 mm but increasing to 200 mm (4 in.) and preferably 450 mm (10 in.) for low frequency traffic noise; edges to the cavity are absorbent,
- flanking paths for sound through adjacent voids must be permanently sealed (flexible joints may be required).

Examples of sound insulation standards are given in Chapter 8, section 7.04.

4.08 Noise penetration from adjacent areas

Main sources of noise	Control measure
<i>Food production and dishwashing areas</i>	
Noise climates around 60 dBA but peaks of impact noise may rise to 85 dB or over (see Chapter 8, section 7.04)	Self-closing, balanced doors. Service lobby with double doors (noise sensitive rooms). Baffle screens (absorbent). Pass-through units to servery.
<i>Toilets</i>	
Flushing jets (78dBA) and impact noise	Separation with intervening space. Heavy, balanced doors (stops). Absorbent ceiling (sensitive areas)
<i>Plant</i>	
Fans, generators, compressors, pumps	Isolation in insulating enclosures
Air-flow turbulence and obstruction	Resilient mountings, flexible couplings
Design of ducts, diffusers and grilles	Velocity and distribution control

4.09 Sound absorption

Absorption of noise is particularly important in a large room (reverberation) and for a more personal or restful atmosphere. The acoustic qualities of a room will change with the numbers of occupants and a balanced absorption of sound is desirable.

Sound absorption is mainly provided by:

Method	Characteristics
Soft, resilient material (curtains, drapes, upholstery, carpets)	Mainly in the higher frequencies 1,000–8,000 Hz. Improved by soft backing (underlay, linings). Absorption coefficients 50–70 per cent
Porous acoustic tiles	Selective absorption, usually over a wide frequency band 48–68 per cent
Panelling with absorbent linings (air resonance)	Specific to low frequencies 125–500 Hz, 5–30 per cent
Building materials (plaster, glass, laminates)	Low absorption – 2–5 per cent, increasing to 10–15 per cent for rough textured surfaces

4.10 Sound systems

Speaker systems are usually incorporated into the ceiling construction using direct radiator (cone) loudspeakers screened by grilles. For large concourses, angled line source speakers

are more common, providing a directional signal. Cone speakers have a sound spread of about 45° and spacing is determined from $2 \times (\text{height} - 1.5 \text{ m})$. Mountings must be vibration free and accessible for adjustment and servicing. Control over volume and tone is essential.

5. Comfort: heating and air-conditioning

5.01 Factors affecting comfort

The environmental conditions for comfort in restaurants and bars must take into account air temperature and movement, humidity and radiation. These components may be represented in terms of equivalent temperature scales or effective environmental temperatures.

5.02 Fresh air requirements

There are two main criteria for air supply requirements:

- *ventilation*: fresh air needed by the occupants and for other purposes (combustion, dilution of fumes). Supplied from outside, direct, partially treated or fully air-conditioned,
- *environmental*: rates of air change needed to maintain suitable conditions (removal of impurities, temperature and humidity control). May be partially or fully recycled with air-conditioning.

Outside air supply rates can be described by :

- volumetric rates of air changes per hour,
- rates of air flow per person or per unit of floor area.

table 5.01																														
Environment	Conditions																													
Air temperature	In Northern Europe design temperatures are usually in the range: 18–20°C(65–68°F) for heating and 23–25°C (73–77°F) (dry bulb) for air-conditioning cooling																													
Radiation	The mean radiant temperature (MRT) of the surroundings should be equal or near to air temperature. For each $\pm 1^\circ\text{C}$ difference in MRT air temperature should be adjusted $\pm 1.4^\circ\text{C}$																													
Relative humidity	Relative humidity should be kept within the range 40–60 per cent. Humidity is adjusted by extracting steam and vapour from the food production and service areas, by humidifying air in heating or cooling to below dewpoint for dehumidification (air-conditioning)																													
Air movement	Parts of the body most sensitive to air movement are the ankles, neck and top of head. Maximum air velocities (at head level) depend on the temperature difference of the air and extent of activity.																													
	<table border="0"> <thead> <tr> <th rowspan="2">Areas</th> <th colspan="4">Usual maximum velocity</th> </tr> <tr> <th colspan="2">Heating</th> <th colspan="2">Cooling</th> </tr> <tr> <td></td> <th>m/s</th> <th>fpm</th> <th>m/s</th> <th>fpm</th> </tr> </thead> <tbody> <tr> <td>High-class restaurant</td> <td>0.2</td> <td>40</td> <td>0.1</td> <td>20</td> </tr> <tr> <td>Cafeteria, bar counter</td> <td>0.35</td> <td>70</td> <td>0.2</td> <td>40</td> </tr> <tr> <td>Dance hall, servery</td> <td>0.45</td> <td>90</td> <td>0.3</td> <td>60</td> </tr> </tbody> </table>	Areas	Usual maximum velocity				Heating		Cooling			m/s	fpm	m/s	fpm	High-class restaurant	0.2	40	0.1	20	Cafeteria, bar counter	0.35	70	0.2	40	Dance hall, servery	0.45	90	0.3	60
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Conditions affecting comfort																														
Too cold	Low air temperatures, draughts, close proximity of cold surfaces (exposed windows, cold walls)																													
Too hot	High air temperatures combined with high humidity or lack of air movement. Local, intense radiation (hot counters, solar heat through windows)																													
Unbalanced	Excessive heat on head, cold feet, unsuitable flooring, draughts																													
Clothing	In winter indoor temperatures are cooler than in summer. Women may be more sensitive to draughts at low level (bare ankles, etc) and to radiation effects of cold windows																													

5.03 Fresh air supply rates

The following standards are based on the Chartered Institution of Building Services Engineers recommendations (metric figures) and those of the American Society of Heating Refrigeration and Airconditioning Engineers, which show some differences.

5.04 Environmental rates of air change

The rates of air change needed to maintain conditions will depend on cooling loads (see section 5.10) but are usually based on the following:

Room	Outdoor air supply(a)					
	Per person, recommended		Per person, minimum(b)		Per m ²	Per ft ²
	litre/s(c)	cfm(d)	litre/s(c)	cfm(d)	minimum litre/s(c)	cfm(d)
Restaurants	18	15	12	12	–	0.75
Cafeterias	12	15	8	10	–	0.75
Cocktail bars	18	30	12	25	–	1.25
Meeting/function rooms	25	40	18	30	6.0	1.50
Dance halls	12	–	8	–	–	–
Offices	12	15	8	10	–	0.25
Small shops, stores	12	20	8	15	–	0.25
Corridors	n/a	n/a	n/a	n/a	1.3	0.25
Toilets	n/a	n/a	n/a	n/a	10.0	2.00
Kitchens (restaurant)	n/a	n/a	n/a	n/a	20.0	4.00

- (a) Rate of extract may be overriding factor.
- (b) Minimum requirements are based on the greater of the calculations.
- (c) Reproduced from CIBSE *Guides*.
- (d) Reproduced from ASHRAE, *Handbook of Fundamentals*.

Mechanical ventilation	Air changes/hr	
Restaurants	10–15	} May be part fresh air, part recycled conditioned air } For non-mechanical ventilation (natural air flow) – 3 air changes/hr
Cafeteria	8–12	
Meeting/function rooms	10–15	
Dance halls	10–12	
Offices (internal)	4–6	} Based on 6.4 litre/s m ² (1.25 cfm/ft ²)
Toilets, WCs(a),(b)	8–10	
Kitchens – overall area(a)	20	} For initial estimates } Checked against installed equipment
over cooking zone	40–60	
Dishwashing area(a)	10–15	

- (a) Refers to rate of extraction.
- (b) Must be separate system with duplicated fans.

5.05 Considerations

Heating and air-conditioning requirements of restaurants, bars and similar premises are subject to particular conditions:

Intermittent use	Short periods of use may necessitate considerable pre-heating with flexibility for recycling and balancing. In hotels and institutions zone and time regulation controls are essential
Variation	Requirements usually change from initial heating (in winter) to subsequent cooling as the occupants and activities increase (see section 5.10)
Fabric loss	Large areas of glass contribute to a high fabric loss (see section 5.06). Double glazing may not be practical unless also needed for sound insulation. Window loss may be reduced by: — perimeter heating to balance temperatures, — screening and curtaining (mesh and heavy curtains), — sheltering (design of façade, canopies)
Extraction loss	Extraction rates from kitchen and toilets, etc, must be balanced (see Chapter 8, sections 7.01–7.09)
Controls	See Chapter 8, sections 8.01–8.06)

5.06 Heating

Space heating requirements depend on the location of the premises, its constructional features, seasonal variations in temperature and the patterns of use. Calculations of heating loads are usually based on the anticipated rates of heat losses:

(a) through the building envelope (mainly by conduction and radiation) determined from the thermal transmittance ('U') value and area of each part of the external fabric of the building.

Thermal transmittance values should not normally exceed:

Area	W/m ² °C	Btu/h ft ² °F
Roof and ceiling (single storey)	0.8	0.14
External walls (excluding glazing)	1.0	0.18
Ground floors (excluding carpet)		
<i>Typical values for windows:</i>		
Single glazing	5.0–6.7	0.88–1.18
Double glazing (20 mm space)	2.8–3.2	0.49–0.56

(b) by infiltration and outside air supply calculated from the volumetric rates of air change and the specific heat (1.013 kJ/kg°C) and density (1.2 kg/m³) of air.

External temperatures in Great Britain are usually based on a prolonged low temperature of –1°C (40°F) although reference should be made to regional variations and to the severity of exposure. Degree – days statistics for each region and month provide a means of estimating and targeting energy consumption.

5.07 Heating systems

The feasibility of alternative heating systems depends on nature and size of the premises, whether they are a sub-lease, the capital costs and space and operating requirements.

Low pressure, hot water systems	Circulation of water at temperatures about 82°C–72°C (180–160°F) from boilers or calorifiers to radiators, convector heaters, fan coil units, skirting heaters, floor or ceiling panels. Also used to provide hot water supplies – through a calorifier or with a direct boiler
Medium- and high-pressure hot water and steam systems	Limited to large building complexes, hotels, hospitals. Medium-pressure systems have a limit of 121°C, 345 kPa (50 lb/in. ²)
Warm air systems	Individual unit heaters with fan and heating element or coil. Used to supplement background heating (over entrance areas, in lobbies and halls) Central warm-air systems with air ducted to grilles or registers around perimeter, below windows and above entrances. Part recirculation of warmed air mixed with outside air for ventilation In summer the heat exchanges may be bypassed, allowing unheated air to be circulated Access for cleaning, replacement of filters and maintenance must be provided Noise limited by low air velocities (adequate duct size, fan rating, design of grilles) Used in small restaurants, snack bars, cafeterias in temperate climates where air-conditioning may not be necessary

5.08 Heat generation

Hot water or steam producing boilers are usually heated by natural gas or fuel oil. Typical efficiencies: 72 per cent (small boilers) to 78 per cent (large packaged units). Electric immersion heaters or electrode boilers may also be used and, in isolated areas, pressurised liquid gas. Regular servicing of equipment is essential with access for replacements. Provision must be made for thermostatic control, time programmes, flue balancing, combustion regulation and monitoring.

Heat exchangers for direct air heating may be gas fired (central systems) or electric.

<i>Key considerations</i>	
Access and storage	For oil and portable pressurised gas. Fire regulations and insurance requirements
Boiler location	Relative value of space. Proximity to air-conditioning plant. Access for servicing and replacement. Flue requirements
Performance	Efficiency at low loads. Alternative or supplementary arrangements for hot water supplies
Operation and control	Costs of attention and servicing. Use of automatic controls with self-monitoring adjustment for external and internal conditions. Remote station installation for centralised information (chain operations)

5.09 Air-conditioning

Air-conditioning is necessary to maintain optimum conditions.

Full air-conditioning, providing filtration, heating or chilling, humidifying or de-humidifying of supply air, is provided in large hotels, building complexes such as convention centres, theatres and shopping centres and in some multi-occupancy buildings. Part air-conditioning with filtration, heating or chilling of air is more common in smaller commercial buildings. In both cases provision is made for controlled recirculation of some of the air.

5.10 Cooling requirements

Producers of heat during the occupation of a premises are outlined in table 5.10.

Calculations of the variable heat gains through fabric, air supply and occupancy conditions are normally computerised.



Sessions House, Peterborough

Modern air diffusers and spotlights blended in a reconstruction of traditional design.



Hôtel Concorde La Fayette, Paris

The Hôtel Concorde La Fayette, adjacent to the International Congress Centre of Paris was completed in 1974. The gourmet restaurant, L'Etoile d'or (85 places), has been entirely redecorated, placing a traditional style in a modern building (c).

5.11 Air-conditioning systems

The choice of air-conditioning system depends mainly on:

- cooling loads (ambient conditions, occupancy, activities),
- type of premises (hotels, multiple occupancy, stand-alone),
- standards (air quality, sophistication of control, acceptable noise).

table 5.10				
		<i>Typical heat produced per person</i>		
		<i>W</i>	<i>Btu/h</i>	<i>Sensible:latent heat</i>
People	Seated at table, resting	120	410	1:1 the latent heat, in-
	Social congregation at bar	160	545	creasing with activity to
	Serving at counter/table	220	750	2:3 at normal tempera-
	Dinner dances, entertainment	260	885	tures
	Discos, strenuous activities	440	1500	
		<i>Typical installed rating</i>		
		<i>W/m²</i>	<i>Btu/h/ft²</i>	<i>W per seat</i>
Lighting	Restaurant, tungsten filament	50	16	100–150
	Cafeteria 'warm' fluorescent	30	10	70–90
	Bar counter, servery lighting	60–90	19–28	
	Lounge seating	50	16	80–120
Solar heat	Maximum intensity varies with latitude, time, orientation and angle of incidence			
	<i>Maximum radiation (typical)</i>		<i>UK</i>	<i>USA</i>
			<i>kW/m²</i>	<i>Btu/ft²h</i>
	Latitude		51–56 N	26–46 N
	On horizontal surface		0.8–0.9	290–260
Vertical SE, SW face		0.5	200	
Internal effects depend on reflectivity of surface, screening and thermal response of building structure. The main gain is usually through windows				
Air supply and infiltration	Cooling for ventilation air calculated from air supply (volume and air supply rate), density, specific heat and temperature difference (see sections 5.03–5.05)			
Equipment	Heat emitted by equipment removed at source, by extraction. Energy recovery for hot water supplies or air to air heat exchange possible (see Chapter 8, section 8.06)			

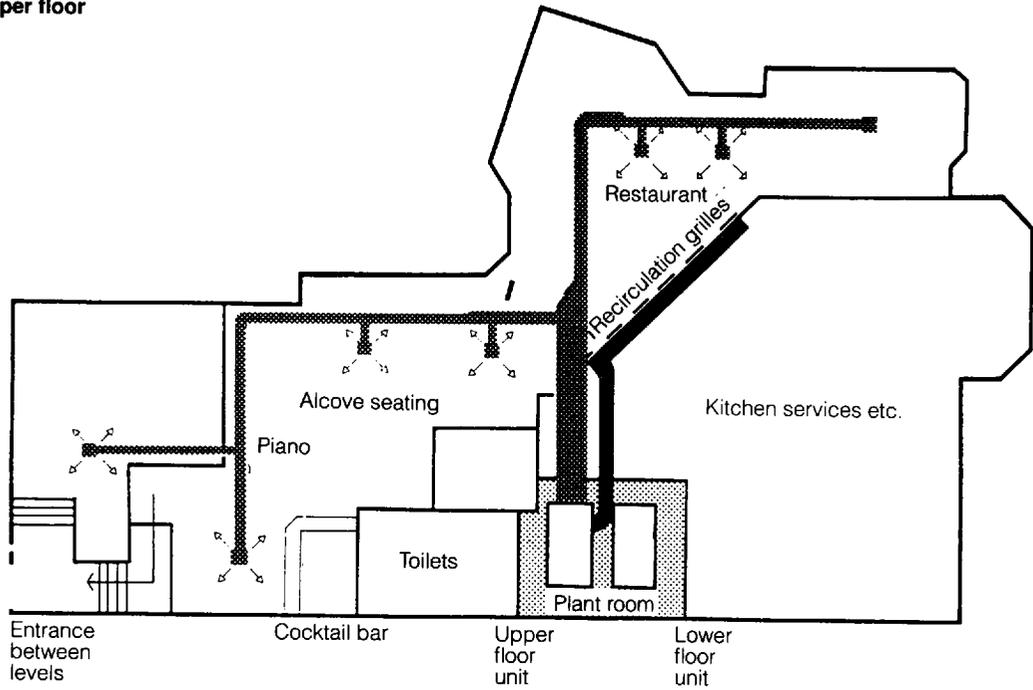
table 5.11		
<i>Type</i>	<i>Main features</i>	<i>Typical uses</i>
Unitary conditioners (room air-conditioners)	Self-contained (fan, filter, evaporator, compressor, condenser, heater), or Split-systems with an external compressor-condenser Designed as console units, through wall or window units Options include reverse flow heat pump, integral heating for domestic hot water	Limited capacity – individual rooms, bars, cellars
Monozone systems	Packaged air-conditioners connected to supply and return air ducts Sited near the room: outdoor (roof mounted) or indoor (plant room) Used with air, water or glycol cooled condensers.	Most stand-alone premises Restaurants in leased shell buildings Public spaces in some hotels, and extensions
Multi-zone systems	Options: use as heat pump Central station plant supplying ducted air to different parts of the building Distribution may be designed for — high (15–25 m/s) or low (3–7.5 m/s) velocity air flow, — all air or only primary air supplies, — dual duct or variable air volume systems, — use with adjustable terminal heaters, fan coil or induction units.	Fully air-conditioned commercial buildings with single or multiple occupancy (offices, shops, departmental stores) High grade hotels

Crown and Anchor Pub, London

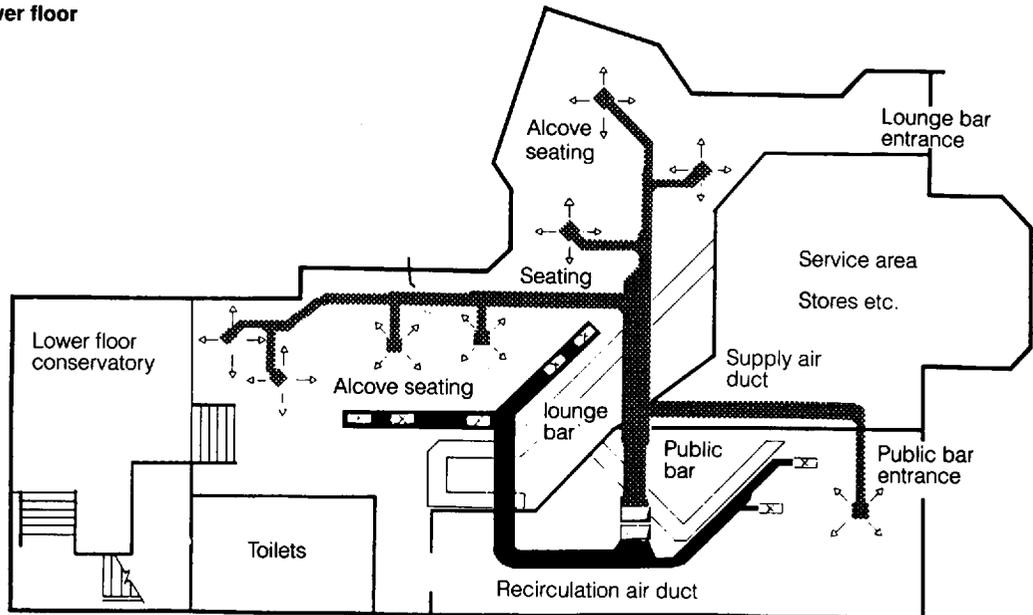
Installation of ducting to two packaged direct expansion cooling units with electric heating sections for air-conditioning in a public house. The total cooling load to meet peak occupancy of around 200 people is 75kW with 10 air changes per hour and 4.5 litre/second fresh air per person.

Equipment: Lennox Industries Ltd
 H & V contractors: Rolfe Engineering Co. Ltd

Upper floor



Lower floor



5.12 Air distribution

Air flows may be distributed by plenum fan through ductwork with branches to terminal grilles or diffusers or through installed ventilated ceilings.

Return air may also be through ducts or separated ceiling voids.

Requirements	
Ductwork	Must be sized and connected to minimise pressure loss and turbulence. Velocities of 7.5 reducing to 3 m/s (1,200–600 fpm) are conventional. Ductwork is usually housed in ceiling voids, vertical service cores and roof top installations
Diffusers	For restaurants, cocktail bars or coffee shops a flow of 290–380 litres/s (600–800 cfm) per diffuser and a temperature differential of 9–10°C (16–15°F) is usually suitable. Temperature differences should be reduced where the ceiling is low
Locations	Air inflows need to be concentrated around areas of heat output (serving counters, doors, windows) and high activity (bars). Grilles (in bulkheads) may be used for horizontal (directional) distribution
Balancing	Air flow and extract rates should be balanced to maintain slight positive pressure (public space) against negative pressure in kitchens, serveries, toilets. High rates of extract over equipment may be localised by supplying tempered, cooled air at low velocity around the perimeter of the canopy
Exhaust air	Grille and registers for return air must be located and designed to avoid short-circuiting, staining and condensation, and be fitted with control and isolating dampers

5.13 Extraction methods

Details of extraction arrangements for main food production areas are given in Chapter 8, section 7.07.

Extraction of heat, steam and fumes from serving counters and back-bar equipment may be facilitated by:

- canopies over grouped back bar equipment in decorative stainless steel, anodised aluminium or other metal,
- high velocity slots positioned about 150 mm (6 in.) above the surface of grilling and frying equipment,
- ceiling grilles above serveries and counters with ducts in the main ceiling or in a lowered

ceiling area combined with directional inlets.

In each case accessible filters and isolating dampers should be installed. All surfaces must be resistant to staining and easy to clean.

6. Other engineering services and terminal equipment

6.01 Hot and cold water supply

Average quantities of water supplies can be estimated from the number of users or from the number of appliances.

table 6.01

Type of premises	Average daily demand/person	
	litres	US gallons
Hotels	135	35
Hostels	114	–
Resident employees	90	24
non-resident employees		
– including meals	45	12
– without meals	30	8
Sports facility users(a)	45	12
Restaurant meals(b)	7.5	2

(a) Showers, washbasins, WCs, excluding swimming-pool water.

(b) Per meal.

Water storage depends on the utility company regulations but normally 24–48 hours' cistern capacity is specified. Water for drinking and cooking purposes should, as a rule, be drawn direct from the supply pipe, and for any other purposes from the distribution network. Chilling of drinking supplies to 10°C (50°F) may be considered.

Rates of flow depend on pressure and pipe diameters. (See also table p. 140.)

6.02 Fire-fighting supplies

Installations for fire control in larger premises are separate from those for distribution and drinking water and include:

- sprinkler or drencher systems incorporated within ceiling design usually at intervals of 3.6–4.3 m (12–14 ft) for automatic fire control in areas of high risk, large congregations of people and escape routes,
- hydrants and flexible hoses at strategic positions within the building particularly on landings and along corridors about 20 m (70 ft) apart.

Provision must be made for maintenance of pressure and avoidance of contamination of any mains supply.

Typical appliance	Rate of flow		Typical temperatures		Notes
	Hot	Cold	°C	°F	
WC cistern	–	0.1	–	–	
Sink – small	0.3	0.2	60	–	18 mm tap
– commercial	0.4	0.3	60–82	–	82°F for sterilisation rinse sink
Shower – rose	0.3	0.3	43	–	Adjustable with thermostatic control
Washbasin	0.1	0.2	50	–	May be reduced to 43°C
Spray taps	0.03	0.03	43	–	Adjustable
Dishwashing machines – large			60–82		Depends on machine capacity
– small					

Type of premises	Typical storage at 65°C (150°F)		Notes
	litres/ person	US gallons/ person	
Hotels	45	12	Heated by direct boiler or calorifier, rated according to demand
Hostels	32	9	
Sports facilities	36	10	
Restaurants(a)	7.5	2	
(a) Per meal			
Key requirements include:			
Boiler or calorifier	Rating depends on demand, balanced by storage, and efficiency (around 70 per cent). Direct boiler/immersion heater may be feasible		
Location	For access and maintenance needs		
Economy	Distribution system planned to reduce individual pipe runs, using secondary circulation where practical		
Insulation	Both hot and cold pipes insulated in ducts		
Energy recovery system	Usually practical from dishwashing waste or heat generating equipment		

6.03 Hot water supplies

Much of the supply is heated to provide water for washing and cleaning purposes, either by instantaneous heaters or storage systems.

Storage capacities depend on the concentration of use (see table 6.03).

6.04 Electricity installation

Electricity mains supplies to premises are generally 3-phase AC with a cycle frequency of 50 or 60 Hz. Supply voltages vary between countries the most common being 240/415 V (UK) 120/208 V and 277/480 V (USA).

Transformers may be required in non-urban areas or for large building complexes. The minimum capacity of the primary transformer should be 150 per cent of peak load requirements. Consideration must be given to siting, ventilation and protection (danger, fire risk, noise, access and maintenance).

The loading of pieces of equipment determines the current ratings of conductors and the phase distribution on branch circuits.

Loads are calculated on the basis of:

— *general lighting loads*: average wattage per unit area for lighting and small appliances.

	Typical		Notes
	W/m ²	W/ft ²	
Restaurant	50	5	} NEC minima 3–5 W/ft ²
Cafeteria	30	3	
Bar/counter, servery	60–90	6–9	} Excluding cooking equipment
Lounge	50	5	

— *individual equipment*: separately rated cooking, dishwashing and powered appliances (see Chapter 8, section 4.02), which are individually connected to one or three phases (depending on rating).

Installed rating	Related to area of	
	kitchen	kitchen + restaurant
Food storage, preparation cooking, service equipment	1.8–2.2 kW/m ² (0.17–0.20 kW/ft ²)	0.4–0.6 kW/m ² (0.04–0.06 kW/ft ²)

Table 6.04 indicates typical loadings per m² for commercial food production and service facilities:

Actual loadings will depend on individual food service requirements.

6.05 Control

Depending on the size of the premises, control may be necessary at a number of stages:

- mains switchgear at point of service entry. In a small restaurant this is usually mounted on an intake panel. In larger premises (hotels, multiple-occupancy buildings), the switchgear should be housed in metal cubicle switchboards in an intake room. Switchgear includes isolating switches, overload protection (circuit breakers or fuses) and earth or grounding connections,
- panel boards at final distribution points serving branch circuits in restaurants, kitchens and other areas,
- isolating switches for equipment, lighting, etc (with or without individual fuse protection).

Panel boards and switchgear must be in safe positions, conveniently accessible, away from damp (steam, water, condensation), protected and suitably labelled.

Provision must be made in spare ways and access space for future changes and additions (10–25 per cent extra capacity).

6.06 Protection

Rating

Conductors (cables, busbars) must be correctly rated for the maximum demand, protected by overload devices and electrically insulated against leakage.

Ducting

The conductors may be enclosed in conduit raceways or ducting to provide protection and access. Metal casings may also serve as earthing connectors. Ducts and conduits may be built into floors (sealed against water entry and drained), walls or ceiling voids with access covers at all major junctions, changes of direction and points of connection. Surface trunking may also be installed above bench height: 1200 mm (48 in.) from floor level or at skirting level.

Separation

Separate ducts or screened compartments must be provided for high-voltage, low-voltage (signal and communication equipment) and emergency supplies.

Temperature

Electrical conductors must be protected from excessive heat (damage to insulation, de-rating), cold and temperature variation (condensation, thermal movement).

Fire risk

Ducts and risers must be firestopped in passing from one separated compartment to the next (from floor to floor or different parts of the building). Combustible material must not be used within the enclosure.

Support

Cables and busbars must be properly supported by trays, clips or brackets, particularly in common ducts or service ways.

Earth Leakage

All metal parts other than electrical conductors must be connected to an earthing or grounding system.

6.07 Gas installations

Gas may be supplied in the form of natural gas (methane), coal or oil derived gas or liquefied gas (propane, butane) in pressurised containers. Gas is used extensively in urban areas for heating and is usually favoured for cooking.

Gas installation, including provision for metering, control, safety protection, air supply damper and flue arrangements, are subject to area utility company regulations. As a rule, gas burning equipment is not interchangeable and the burners, air regulators, pressure governors, safety devices and controls are specific to the properties of the gas.

Portable liquefied gas may, however, provide an alternative fuel for cooking where mains supplies are not available and is also used for special grilling and barbecue equipment and for cooking at the table. Precautions are required for

storage of containers and to prevent risk of explosion and fire from leakage.

7. Safety and security

7.01 Coverage

Requirements for safety and security may be stated (expressly or by implication) in:

- legal provisions for employment, licensing, food handling, warranties for installed equipment and engineering services,
- conditions of insurance of premises, business, contents,
- general obligations to maintain safe premises (occupiers' liability).

Subject	Requirements
Employees	Design, location, use and maintenance of equipment to avoid accidents. First aid facilities. Washing and changing facilities. Drainage of floors. Disposal of waste. Fire protection and safe means of escape. Specific instructions and training
Customer	Safe entrances, steps, stairs, emergency exits, including fire escapes. Clear directions. Proper maintenance and hygiene. Sanitary facilities
Premises	Security against intruders. Provisions for safekeeping valuables. Resistance to vandalism, damage, fire. Repair and maintenance of property

7.02 Employee safety

The safety, health and welfare of employees is governed by specific legislation such as the Safety at Work Act and Regulations. Staff representation on safety matters is important. Specific risks include:

- burns and scalds – contact, splashes, spillages, etc, from hot equipment, and containers, often as a result of poor design, awkward position, heavy lifting, over filling, congestion,
- cuts and lacerations – knives, sharp edges, etc, from handling tools, with greasy surfaces, congested or restricted working space, un-guarded blades and machinery,
- bruises and breakages – from slipping, falling, etc, on wet, greasy floors, worn or uneven steps or pavings, congested doorways and passages,
- electric shocks – from exposed electrical conductors, touching poorly insulated fittings with wet hands, under-protected wiring;
- fire or explosion – as a result of fat spray,

accumulated grease, spillages of oil, ignition of fabrics, gas leakages, overloaded electrical circuits.

These risks are exacerbated by hot, humid conditions, poor lighting and noise distraction.

7.03 Safety from fire

Provisions for dealing with outbreaks of fire include:

- active defence through detection and control,
- passive defence by selection and combination of building materials which will inhibit or resist the spread of fire and its effects, and
- means of escape which are safe and appropriate to the number of occupants.

Requirements for fire precautions vary from one premises to another, depending on its particular classification and conditions of use. While the following details apply generally, the views of the Building Control and Fire Authorities should be sought for specific directions.

7.04 Active defence

Methods	Provisions
Emergency procedures	Instructions to staff. Routine inspection of equipment, escape routes, services
Detection of fire	Automatic gas, smoke or temperature rise indicators with warning instruments
Automatic isolation	Isolating dampers installed in extraction ducts. Self-closing smoke doors in corridors
Sprinkler systems	Sprinkler valves fitted over escape routes, and in public areas
Fire-fighting equipment	Distinctly marked and coloured (red, yellow) equipment provided and maintained: <ul style="list-style-type: none"> — hydrants and fire hose in landings, and corridors (recessed) within 20 m of every part of the building — portable extinguishers: <ul style="list-style-type: none"> foam – in restaurant area, stores carbon dioxide – for electrical equipment fire blankets – for local fires in kitchen
Ventilation	Automatic exhaust and relief ventilation (pressurised) may be installed
Emergency lighting	Maintained lighting for public areas, escape routes and signs

Typical requirements(a)	Minimum fire-resisting periods(b)		
	½–1 hour(c)	2 hours	4 hours
Single storey – floor area up to	3,000 m ²	No limit	
Basements – floor area up to	2,000 m ²	3,000 m ²	Larger buildings, separating walls
Multi-storey – height up to	28 m	No limit	between properties, special cases
– volume up to	7,000 m ³	7,000 m ³	

- (a) Subject to Local Codes and Regulations.
- (b) BS 476: Part 8: 1972. Fire resistance tests for stability, integrity and insulation performance.
- (c) Half hour permitted for small single- and two-storey buildings.

7.05 Structural protection

Constructional measures to reduce the risks and damage from fire in buildings include:

- fire-resistant construction of separating enclosures (kitchens, stores, boiler houses, transformer rooms, car parks) and structural elements of the building;
- fire protection of stairs, elevators, lifts, lift-chutes, ducts and corridors to prevent entry and escape of flames and smoke,
- smoke isolation of dining rooms or kitchens from other areas of the building by means of self-closing smoke control doors,
- lining and surface materials which are non-propagating or have a low rate of surface flame spread (see section 7.06),
- means of fire escape positioned and constructed to allow safe exit for occupants (see section 7.07).

7.06 Lining materials

Specific consideration must be given to the characteristics of lining and surface materials and their behaviour exposed to fire:

- surface flame spread – rate of propagation of flames across the surface:
 - decomposition and toxicity – ignition temperature, heat generation (calorific value), production of smoke and toxic gases,
 - deformation, melting, shattering of the material, allowing fire penetration, and creating additional hazards for occupants.

Typical limitations in the use of surface materials are indicated. These will vary with local requirements. Suitability of surface finishes with varying fire resistances:

Classification	Non-propagating	Very low	Low	Medium	Rapid flame spread
BS 476: 1971	Class O	1	2	3	4
NFPA	Class A	B	C	D	E

Type	Examples	Conditions of use
Inorganic materials	Brickwork, blockwork, plaster, ceramic tiles, asbestos boards	Any situation including passageways and corridors
Materials of very low surface flame spread	Wood wool slabs, plaster board, thin paper and vinyl coverings on an inorganic base	
Cellulosic materials	Timber, hardboard, particle board, blockboard	In restaurants, lounges, bars if flame retardant type. Mostly limited to small areas (2.5 m ²) at least 3.5 m apart in ceilings. The aggregate area on walls should not exceed half floor area
Thermosetting plastics Heavy flock wallpapers	Decorative laminates	
Thermoplastics	Expanded polystyrene Polyvinyl chloride	Self-extinguishing type only. Used in separated small areas (4 m ²) of limited thickness in ceilings. Aggregate area not to exceed half floor area

Note: Subject to Local Building Regulations, By-laws or Codes and to Fire Authority approval.

7.07 Means of escape in event of fire

Specific requirements are laid down in legislation (Building Regulations, Codes, Licensing, Fire Precautions Act, Health and Safety at Work) and in

technical guidance notes issued by Government Departments. The following details (based on Codes of Practice for London) outline some of the principles:

table 7.07	
Evacuation	The time to reach a protected route or safe exit is based on average of 2½ minutes. The rate of evacuation is about 40 persons/min/unit width (0.53 m)
Travel distances	Maximum direct distances to protected staircase or exit
	<i>m</i> <i>ft</i>
	<i>Small restaurants and bars</i> (not more than 280 m ²) with single exit:
	– in basement or first floor
	– at ground level
	12 40
	18 60
	<i>Larger restaurants</i>
	– with two or more exits at remote ends (45°)
	– dead ends with one escape route
	30 100
	12 40
	<i>Kitchens, high risk areas</i>
	– up to 6 m long or wide with one exit
	– over 6 m long or wide with alternative exits
	6 20
Conditions	Actual travel distances (around furniture, etc) must not exceed 1½ times these limits. Exits from restaurants must not be through areas normally limited to staff (kitchens, stores). Open cooking equipment must not obstruct exits.
Number of occupants	Calculated from the number of seats or assessed from floor area:
	Restaurants, cafés
	1.0–1.5 m ² /person (10–15 ft ²)
	Bars, including standing room
	0.3–0.5 m ² /person (3–5 ft ²)
Width of exits	Stairs and corridors are based on nominal width per person of 0.53 m (22 in.)
	<i>Minimum widths</i>
	<i>m</i> <i>in.</i>
	Small premises up to 50 persons
	0.76 30
	Minimum width up to 240 persons
	1.10 43
	Increasing by 0.1 m per additional 20 persons up to 300
	1.50 59
Protection	Each staircase or corridor is designed for the maximum number of occupants
	Protected staircases must be adjacent to an external wall with natural ventilation at each level. Enclosures must be fire resisting
Areas of high fire risk	Kitchens, stores, boiler or transformer rooms and garages, must be separated by fire-resistant construction. Lifts from car parks must be separated by a protected lobby, with outside ventilation
Linings of protected routes	Non-combustible or Class 1 linings must be used. Any fabric materials (curtains, etc) must be non-flammable or flame proofed
Final exits	Exits from the building must give direct access on to the street or open space. A proportion may open to a shopping arcade or mall
Doors	Emergency exits must open outwards with simple release fastenings (panic bolts, latches); half-hour fire resistance is usually required
Staircase	Planning: straight flights of 3–16 steps separated by landings
	<i>m</i> <i>in.</i>
	Clear vertical headroom (a)
	2.060 81
	Step proportions: for public use and assembly:
	tread (excluding nosings)
	0.280 11
	rise (maximum)
	0.150 6
	Small premises (up to 100 users)(b)
	tread
	0.250 10
	rise
	0.190 7.5
	Handrails: on each side (unless less than 1.1 m wide)
	Central handrail for staircases wider than 1.800 m
	Vertical height(a)
	0.840–33 to
	1.000 39

	Balustrading: minimum height usually	1.050	39
	Ramps:		
	maximum gradient	1:10	
	for disabled persons	1:12	
	Glazing: fire-resistant construction		
Exit signs	<i>Viewing distance</i>	<i>Minimum letter size</i>	
		<i>mm</i>	<i>in.</i>
	Public viewing, over 25 m	125	5
	Room viewing 15–25 m	75	3
	Close proximity within 15 m	50	2
Safety lighting	Normally required throughout restaurants, public houses and banqueting rooms (except small single-storey premises) and in escape routes		
	May operate continuously or automatically using:		
	— centrally charged battery system (minimum 3 hours' life)		
	— individual, self-contained batteries		
	— engine driven generator (within 15 seconds)		
Ventilation	Exit routes and staircases must have external ventilation. In large buildings provision should be made for pressure venting		
Maintenance	Exit routes and emergency equipment must be regularly maintained and kept clear of obstructions and combustible material		

(a) Measured from line of nosings.

(b) May be made steeper for secondary stairs.

Note: Local Regulation, By-law or Code requirements must be consulted.

7.08 Security

Specific requirements relating to security are dictated by:

- *location*: areas of high vandalism,
- *insurance*: degree of risk, premiums and conditions,
- *stocks*: value and quantities,
- *employees*: numbers, shift duties.

<i>Typical provisions</i>	
Employees	Changing areas with lockers, time recording, supervision, employment records, separate staff entrance (larger premises)
Goods	Separate entrance with checking and weighing facilities. Lockable store-rooms – separate for valuable stocks. Issue and stock control systems
Customers	Entrances located to allow supervision. Safe facilities for receipts and wages
Doors	See Chapter 4, section 1.14. Stout external doors with lattice or outer door protection at night. Door frames secured to walls by rag bolts
Locks	Good quality lever design, preferably with mortice fixing. Emergency doors (outward swinging) fitted with release bars 1050 mm (42 in.) high and locksets to prevent unwanted entry

Windows	In areas of risk, windows may be: <ul style="list-style-type: none"> — divided by metal frames of less than area 0.05 m² (0.5 ft²), — protected by bars, minimum section 18 mm (¾ in.) spaced not more than 100 mm (4 in.) apart and welded to frames, — fitted externally or internally with removable or rolling metal grilles or shutters
Building	Strong walls for exterior and store-room protection. Wire mesh screens or metal faced cabinets may be used to separate valuable liquor, stocks, etc
Security systems	Depending on the size and nature of premises detection systems may include: <ul style="list-style-type: none"> — magnetic contacts – opening of doors, windows, — wiring systems – displays, secure areas, — pressure mats – in passageways, landings, etc, — infra-red beams – across openings, doors, — ultrasonic or microwave systems – volumetric patterns, — closed circuit television – observation monitoring. Each installation provides a detector, amplifier/controller and alarm or telephoned warning

7.09 Hygiene requirements

Details of hygiene are given in Chapter 8, section 6.11.

7

Furniture, Furnishings and Equipment

1. Seating and table arrangements

1.01 Sizes and dimensions

Furniture selection is dictated by a number of requirements. The dimensions must be related to:

- anthropometric data – the representative body dimensions of the people expected to use the establishment,
- room dimensions – the area, shape and limiting dimensions of the room,
- customer needs – uses of the room, standards expected, time taken over meals, groupings of customers,
- operational needs – place settings, length of reach and space for service, seat turnover, changes in layout.

1.02 Anthropometric factors

Body dimensions vary with sex, age, and the racial characteristics of the population. Most standard ranges of furniture are designed to suit the middle 75 per cent of users.

To some extent furniture can be adjusted to size and posture with the use of upholstery, padding and springing or flexing. Adjustability is essential in high-class establishments. In high-turnover operations, particularly with younger age groups, durability, capacity and maintenance of a restaurant may take precedence over comfort and more restrictive dimensions may be used.

The principle measurements for furniture design are illustrated.

1.03 Room dimensions

To determine seating layouts and densities, table seating modules may be used. Modules allow for the sizes of seats and tables plus access, service and circulation space.

Booth or alcove seating may be used for maximum capacity but restrict flexibility in table sizes and groupings.

Banquette seating enables seats to be placed against walls and partitions.

1.04 Customer and operational needs

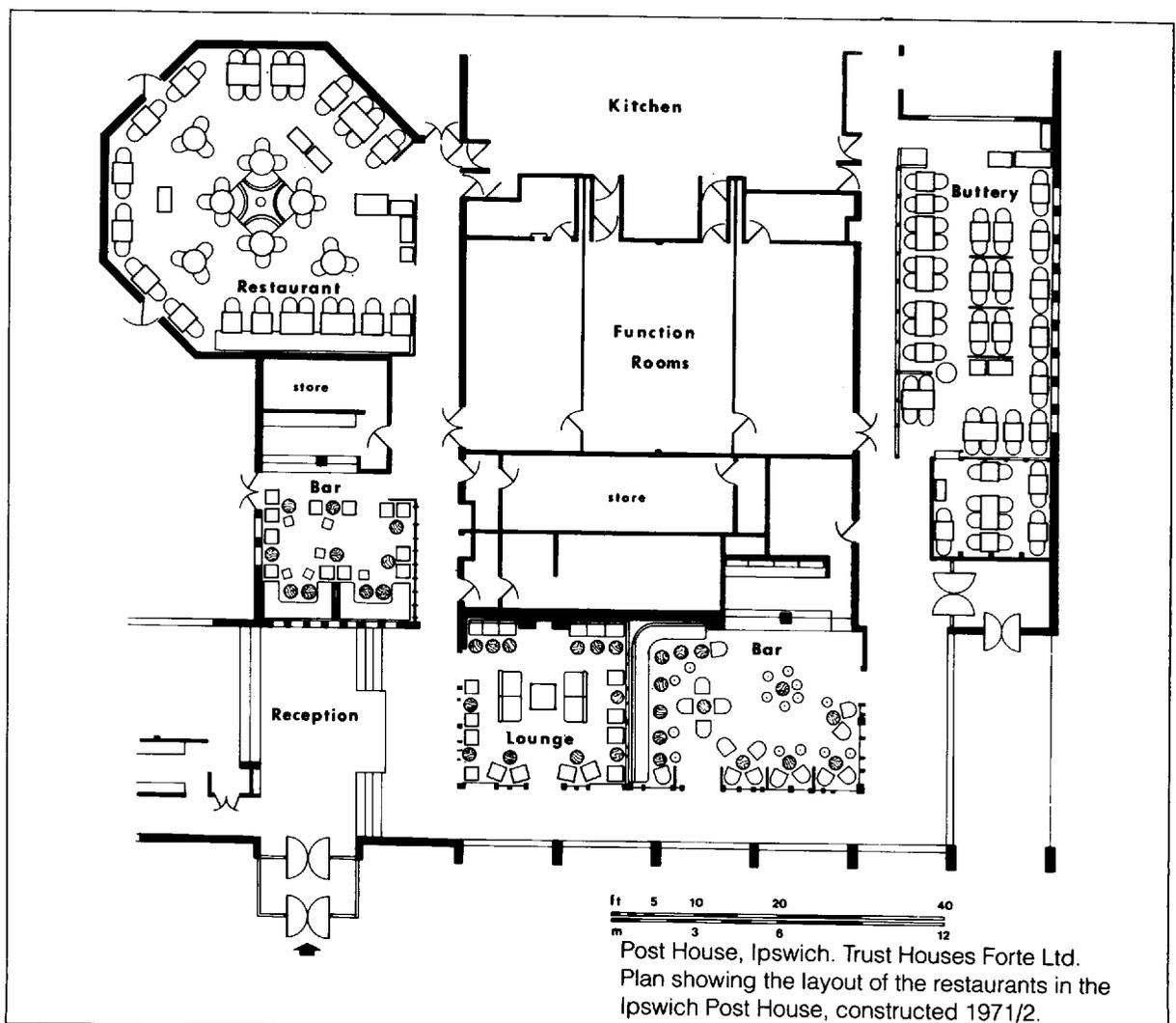


table 1.04																																																									
Considerations	Typical provisions																																																								
Place settings (widths)	High class 600 mm (24 in.). Standard 530 mm (21 in.). Minimum 480 mm (19 in.). The critical distance is 90 mm (3½ in.) in from the periphery. Affects spacing of seats, diameters of round tables, positions of table legs																																																								
Table sizes (typical)	<table border="0"> <tr> <td><i>mm</i></td> <td><i>in.</i></td> <td></td> </tr> <tr> <td>700× 700</td> <td>27×27</td> <td>Minimum for 2 persons</td> </tr> <tr> <td>750× 750</td> <td>30×30</td> <td>2 (high class) – 4 persons</td> </tr> <tr> <td>750×1,200</td> <td>30×48</td> <td>4 persons</td> </tr> </table>	<i>mm</i>	<i>in.</i>		700× 700	27×27	Minimum for 2 persons	750× 750	30×30	2 (high class) – 4 persons	750×1,200	30×48	4 persons																																												
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Flexibility	Standard 750 mm tables may be placed together for groups. Square and round tops may be interchangeable																																																								
Service	Maximum reach 750 mm (30 in). 600 mm (24 in.) preferable for silver service																																																								
Standards of comfort	Upholstery adapts to body postures and shapes. Increased width and depth of seating allows for body movements. Arm chairs provide extra support for relaxation																																																								
Dining-room chairs	Normal dimensions <table border="0"> <tr> <td></td> <td colspan="2"><i>Depth</i></td> <td colspan="2"><i>Width</i></td> <td colspan="2"><i>Height</i></td> </tr> <tr> <td></td> <td><i>mm</i></td> <td><i>in.</i></td> <td><i>mm</i></td> <td><i>in.</i></td> <td><i>mm</i></td> <td><i>in.</i></td> </tr> <tr> <td>Seat</td> <td>400–450</td> <td>16–18</td> <td>400–450</td> <td>16–18</td> <td>400–450</td> <td>16–18</td> </tr> <tr> <td>Overall</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Side chairs</td> <td>480–640</td> <td>19–25</td> <td>400–500</td> <td>16–20</td> <td>810–970</td> <td>32–38</td> </tr> <tr> <td>Arm chairs</td> <td></td> <td></td> <td>530–600</td> <td>21–24</td> <td></td> <td></td> </tr> <tr> <td>Seat angle</td> <td colspan="6">0–5° slope back</td> </tr> <tr> <td>Back angle</td> <td colspan="6">100–105°</td> </tr> </table>		<i>Depth</i>		<i>Width</i>		<i>Height</i>			<i>mm</i>	<i>in.</i>	<i>mm</i>	<i>in.</i>	<i>mm</i>	<i>in.</i>	Seat	400–450	16–18	400–450	16–18	400–450	16–18	Overall							Side chairs	480–640	19–25	400–500	16–20	810–970	32–38	Arm chairs			530–600	21–24			Seat angle	0–5° slope back						Back angle	100–105°					
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Effect on room	The height and prominence of the chair back is dictated by style (e.g. ladder back). Heavy framed, tall furniture tends to make a room appear more crowded and dominates views. Light-framed chairs (e.g. bentwood) appear to give more open space																																																								
Table heights	Tables must be related to the height of the chairs. <table border="0"> <tr> <td colspan="2"><i>Chair seat height</i></td> <td colspan="2"><i>Table height</i></td> <td colspan="2"><i>Minimum clearance height to underside of frame</i></td> </tr> <tr> <td><i>mm</i></td> <td><i>in.</i></td> <td><i>mm</i></td> <td><i>in.</i></td> <td><i>mm</i></td> <td><i>in.</i></td> </tr> <tr> <td>450</td> <td>18</td> <td>760</td> <td>30</td> <td>570</td> <td>22½</td> </tr> <tr> <td>430</td> <td>17</td> <td>710</td> <td>28</td> <td>620</td> <td>24½</td> </tr> </table>	<i>Chair seat height</i>		<i>Table height</i>		<i>Minimum clearance height to underside of frame</i>		<i>mm</i>	<i>in.</i>	<i>mm</i>	<i>in.</i>	<i>mm</i>	<i>in.</i>	450	18	760	30	570	22½	430	17	710	28	620	24½																																
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Bar stools	Standard bar or counter stools are usually <table border="0"> <tr> <td></td> <td><i>mm</i></td> <td><i>in.</i></td> </tr> <tr> <td>Seat height</td> <td>760</td> <td>30</td> </tr> <tr> <td>Width and depth</td> <td>460–480</td> <td>18–19</td> </tr> </table> The stability of the stool is critical and footrests (brass, chrome) must be provided		<i>mm</i>	<i>in.</i>	Seat height	760	30	Width and depth	460–480	18–19																																															
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Seat height	760	30																																																							
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Lounge seats	A lower height with increased back angle is suitable for relaxation but is awkward for eating table set meals. <table border="0"> <tr> <td></td> <td colspan="2"><i>Typical heights</i></td> </tr> <tr> <td></td> <td><i>mm</i></td> <td><i>in.</i></td> </tr> <tr> <td>Lounge seats (seat height)</td> <td>450</td> <td>18</td> </tr> <tr> <td>Tables</td> <td>700</td> <td>27</td> </tr> </table>		<i>Typical heights</i>			<i>mm</i>	<i>in.</i>	Lounge seats (seat height)	450	18	Tables	700	27																																												
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1.05 Design considerations

Furniture must be in keeping with the style and decor of the room. Consistency and harmony in design are critical in establishing a suitable ambience.

The style of design may be:

- *traditional*: based on a period of time or style created by a particular school or movement,
- *hybrid*: influenced by traditional designs but incorporating modern adaptations,
- *contemporary*: using current materials and ideas to create new interpretations.

As a rule, any mixing of styles requires careful balancing of colour, texture and form to retain the unity. Elegant sophisticated styles or materials (fine grained wood, brocades, velours, etc) should not be used with rustic forms. Traditional furniture is invariably reproduction or a modern interpretation but antiques may be featured to enhance the effect. This also applies in ethnic and speciality restaurants.

Restaurant design tends to reflect particular periods with which a particular style of living (elegant, homely, functional, etc) is often associated.



(a)



(b)

Hôtel de Crillon, Paris

The Hôtel de Crillon is part of two palaces designed by the architect Jacques-Ange Gabriel and commissioned by Louis XV in 1758. Established as a luxurious hotel in 1909, it is now owned by the Taittinger family and has undergone extensive renovation whilst retaining its sumptuous character.

The popularity of the restaurant Les Ambassadors (a), considered one of the best in Paris, encouraged the hotel to provide an alternative, L'Obelisque (b), which offers light meals with a quick, informal service.



Eugenie's Lounge Bar and Geiza Grill Restaurant, Cairo Marriott Hotel, Egypt (a)

sculptures, marble, mirrors, artwork and chandeliers to create the Eugenie's Lounge Bar (commemorating the visit by Napoleon III and Empress Eugenie) (a) and speciality restaurant (b).

Restoration of the original palace built in 1869 has been carried out parallel with the development of the adjoining 1,250 room hotel. The work involved the painstaking repair and replacement of the mouldings,

Design consultants: KBA International Inc, USA

<i>Examples</i>	<i>Influences</i>
High-class restaurants	18th–19th century, Queen Anne, Georgian
Formal functions	Regency, Classical
Pubs, clubs	19th century, Victorian, Edwardian
Character restaurants	16th–17th century, Elizabethan, Jacobean, early colonial
New food concepts	Art nouveau, Bauhaus, contemporary
Fast food	Modern, domestic

Maintenance	Requirements, specialised services, contract arrangements, replacements, life cycle of use
Construction	Stability, materials, strength of frame and joints, damage to floor, fire risks, durability of surfaces and coverings
Mobility	Weight, handling, stacking, demountable tables, interchangeable units, multi-use
Cost	Initial cost, cost of cleaning and maintenance, replacement costs, life cycle equivalent cost

The ambience created by design is an important part of the overall meal experience.

1.06 Practical considerations

Key requirements in selecting or specifying furniture and equipment are summarised below:

<i>Requirements</i>	<i>Considerations</i>
Durability	Intensity of use, covering, cleanliness, retention of appearance
Individuality	Design requirements, availability, manufacturing specifications, replacements, comparisons with standard ranges

1.07 Types of tables and seating

- Alternative arrangements include:
- *loose or free-standing tables*: legged or pedestal types with fixed or interchangeable tops which may also be linked together,
 - *fixed tables*: legged, pedestal or cantilevered types with fixed or adjustable tops,
 - *loose chairs*: legged or pedestal types,
 - *fixed chairs*: booth or banquette seating.

The layout may provide all fixed or all loose furniture, or combinations to provide flexibility in choice and arrangement. For example, there might be banquette seating on one side of fixed tables with loose chairs for extra seating.

Details of construction are outlined in section 3.01–3.04.

2. Interior landscaping and features

2.01 Function

Flowers and plants are used for a variety of purposes in interior design:

<i>Examples</i>	<i>Applications</i>
Landscape creation within interior space	For interest, relaxation, softening of hard surfaces and stark outlines (as in atria, courtyards, lobbies)
Screening, separation, barriers, enclosures	To separate seating areas from circulation areas, to screen service areas, channel traffic movements
Personalisation of tables, and place settings	Table arrangements and side-table displays of flowers, complementary to decor and space
Environmental benefits	Humidity balance (transpiration, water features) moderate noise attenuation, introduction of colour accents

2.02 Conditions

Plants developed for interiors are tolerant of shade, have slow uniform growth and metabolisms over a range of low light levels. Professional advice should be sought on the selection of plants, their tolerance, habits, height, successful combination with others, maintenance, etc. The main considerations may be summarised:

Lighting	Most species require 600–700 lux to grow satisfactorily (some only 500 lux). At low levels variegated foliage tends to lose colour. Local feature lighting can be used to supplement background levels and plant positions may be rotated. In restaurants, regular replacement of plants is usually necessary
Colour	The red spectrum tends to produce etiolation. A red–blue balance over 400–700 nanometre range is needed for natural colour
Daylight	Plants may bend towards light. Direct sunlight can produce scorching.
Watering	Alternatives include manual watering every 2–4 days; reservoir-based containers; automatic irrigation systems with water circulation
Substrate	Firm root anchorage is required for tall plants using peat-loam or perlite, vermiculite base. Hydroculture may be installed in large schemes

Environment	Normal temperatures, 21°C (up to 27°C in pool landscaping), with 45–50 per cent relative humidity suitable. Plants should not be exposed to draughts (air speeds in excess of 1.5 m/s), cold (below 13°C), radiated heat or hot ducted air (including cooking equipment)
Containers	Aluminium, glass, polythene or glazed ceramics in sizes up to 600 mm, glass reinforced polyester for larger planters up to 750 mm diameter, 1,500 mm long. Round, hexagon, square, rectangular shapes. Located at floor level, recessed or elevated (balcony, wall, hanging basket)
Displays	Large, single species used for dramatic impact (in halls, atria). Mixed groups selected for interesting shapes, colours, textures. Trellis climbers used for screening, pendulous forms for cascades
Maintenance	Regular contract maintenance is essential and should include watering, cleaning, feeding, pest control and treatment (non-toxic) of diseased plants and replacement
Flowers	Flowers generally have a short life (high carbohydrate and transpiration loss) and should be replaced frequently. Large displays are impressive but small table arrangements tend to be more personal. Consideration must be given to colour harmony, shape of vases, stability of arrangement and the possibility that they might cause allergies.

2.03 Other features

Restaurants may incorporate specific features which are complementary to the design or operation.

<i>Subject</i>	<i>Examples</i>
Theme of design	Artifacts, antiques, points of interest
Food service	Featured equipment (new or old), displays of food, fruit, wine
Local character	Prints, exhibitions of paintings, crafted fittings or furniture
Atmosphere	Historical and locational associations, reconstructed features

Background interest requires careful interpretation and balance in design to avoid over-elaboration.



Tunny Net Restaurant, Malta

The theme of this high quality restaurant is represented by displays of scale models, pale blue carpet and lighting with a dominant deckboard ceiling.

Design consultants: Edwin Bonello and Associates

3. Furniture requirements and constructional features

3.01 Chairs

Chair design ranges over a wide variety of styles which can be broadly grouped into five types:

Type	Features
Framed	With framed seat and back, the back usually extends down to form the legs. May be strengthened by cross members. The back may be open, upholstered (padded) or woven. Seats may be fully upholstered or have upholstered inserts or pads. Examples: oval back, ladder back, Queen Anne styles
Bentwood	Bent cane or beechwood used to form a framework
Stick chairs	Turned spindles used for back and legs set in a solid seat or frame. Examples: Windsor, colonial
Cantilevered	Bent tubular steel (round or square section) forming a continuous support for the seat and back.
Moulded	Polypropylene and other thermo-setting plastics moulded to form the seat and back. May be fixed to metal legs or to a pedestal of plastic or metal. The moulded shape may be fitted with upholstered covers

Chairs may be free-standing, or fixed to the floor or to an extended frame. In the latter, the chair

may be designed to swivel. Swivel chairs are often useful for counter seating, but tend to look untidy unless they are self-returning.

3.02 Selection of chairs

Features	Considerations
Strength	Joint construction and rigidity is critical. Wood framed – mortice and tenon joints. Metal framed – welded, riveted or screwed to firm anchorages
Wood	Type of wood and grain cutting (risk of splitting) are important. Smooth, rounded edges required to avoid snagging of clothes
Cross bracing	Obstructive and liable to be damaged. Front rails should be avoided
High backs	Affect visibility and mobility. Finials tend to catch sleeves. Short backs with gap above seat (avoiding dust collection) usually preferable
Flared legs	Extended legs liable to damage wall or furniture and cause stumbling
Ornamentation	Carving is liable to snag, collect dust and add to maintenance costs. Woven cane work limited to backs
Arm chairs	Require more width and access space. Less mobile. Arms must not catch or bind with table
Mobility	Chair legs fitted with glides or buffers (to reduce carpet damage), Stacking chairs must interset without damage and usually require simple metal frames. Stacks of chairs fitted with castors or dollies
Upholstery (coverings)	Padding reduces soiling of edges. Covering material should wear well (rubbing tests), retain colour (colour fastness) and texture without piling. Colours and patterns should camouflage marking or shading and must allow for frequent spot and general cleaning (may be treated)
Performance criteria	Standard tests for upholstery fabrics include: abrasion test (e.g. 50,000 rubs at 794 g (28 oz) loading), light fastness, fastness to sponging and wet and dry rubbing, resistance to seam slippage, piling and snagging, flame retardancy, stain repellancy and retention of appearance
Types of covering	Covering may be grouped into: — sheet materials – hide, expanded PVC (on fabric base), — pile fabrics – velvets,

	<p>velours, etc, — flatweave fabrics – plain weaves, fancy weaves, cords, moquettes. Pile fabrics generally look better and are more resistant. Flatweaves cover a wide range of materials with variations in thickness of yarn and emphasis of warp and weft. The sett and yarn density is important in resisting abrasion, piling and slippage</p>
Materials	<p>Fibres include wool blends, polyacronitile (Draylon), polyesters and polyamide</p>
Support	<p>The base may be solid wood or polypropylene or open webbing (fabric, elasticated or metal sprung). Filling and cushioning materials include moulded foamed polystyrene or latex</p>
Framing	<p>The main materials are: — wood – stained and polished or painted (lacquers, acrylics). Natural finishes tend to show less damage, — tubular metal – chromed, stainless or enamelled steel, anodised aluminium. Matt finishes tend not to show finger marks, — plastics – (polyurethane) textured surfaces show less marking</p>
Comfort	<p>(see section 3.01)</p>

Legs	<p>edges must be properly lipped and plastic laminate surfaces balanced for stability</p> <p>Legs must be positioned between seat positions (see place settings). Cantilevered or inset legs are preferable.</p> <p>Firm, even support is essential with glides or feet to protect the floor. For functions, table should be collapsible, demountable or knockdown, with truck carriers for transport and storage</p>
------	---

3.03 Selection of tables

Features	Considerations
Shape	<p>Circular tables provide variety and informality and can take up less space in the centre of the room. Square or rectangular tables allow regularity, a sense of order and may be joined or extended as required</p>
Surface	<p>Exposed surfaces are usually natural wood (protected) or laminated plastic (which may have simulated wood or other designs to camouflage marks). Gloss reflections avoided. Resistance to scratching, cigarette burns, heat, spillage, grease and abrasion is important. Wipe-clean surfaces are normally required</p> <p>Covered surfaces may be natural wood (unstained) or covered by baize cloth to give firm surface</p>
Construction	<p>Rigid, firm support with dimensional stability is essential. There must be no hazardous projections from the undersurface or frame. Ply, block or chipboard bases are commonly used. The</p>

3.04 Sideboards

For many restaurants providing waited service, it is necessary to provide a sideboard (*étagère*) or service station for each group of tables served.

The sideboard is typically about 900 mm (36 in.) wide, 375 mm (15 in.) deep and 800 mm (32 in.) high with raised back and sides.

A standard layout is usually adopted to facilitate checking and use:

- *work top*: metal hotplate (heated by electric element or spirit lamp). Clear area for dishes and plates in transit,
- *drawers*: spare cutlery (felt-lined),
- *cupboard*: spare condiments and table accessories,
- *shelves*: side plates, etc, for making up tables. Spare table linen, napkins, serving cloths (a separate holder may be provided for used linen).

The location of sideboards in relation to the tables is critical (noise, disturbance, screening) and the surface materials and style must be in keeping with the decor of the room.

3.05 Serving trolleys

Food served from trolleys may be used for gueridon service or to provide a selection of choice at the table (sweets, salads, pastries, etc).

In planning for trolley service, tables must be arranged in fairly regular formation with wide aisles or circulation space. As a rule, a clear width of at least 1,050 mm (42 in.) must be provided, increasing to 1,350 mm (54 in.) near entrances and main circulation routes.

Trolleys may be specifically designed for a particular setting, and the basic functional requirements of trolleys include:

- *wheels*: movement must be smooth, silent and easy with swivel arrangements for turning into position. For carving or preparation of food, wheels should be lockable,
- *surface*: trolleys usually have a display or working surface with a shelf below, both fitted with low rims to prevent dishes sliding off,
- *gueridon service*: portable gas or spirit burners may be built into the surface,

— *decoration*: decorative stands may be fitted for displaying salads, fruit, sweets or pastries. The loaded trolley must be stable and easily accessible for service.

4. Furnishings

4.01 Furnishings

Furnishings add to the character of a room, providing texture, colour, soft shapes and warmth. They also absorb noise, particularly in the higher frequencies, and provide heat insulation both for the room and for contact between the body and harder surfaces. A wide variety of furnishings available enables the decor, style and service of a room to be quickly and inexpensively changed, for example:

<i>Changes in service</i>	<i>Changes in furnishings, etc</i>
Informal lunches (plated service)	Table tops exposed with place mats and paper napkins. Simple uniforms. Mesh curtains
Evening dining (silver service)	Table cloths with matching napkins. Formal uniforms. Draped curtains
Special events (buffet service)	Coloured table cloths. Featured works of art. Themed uniforms, suspended screens

In each case, changes in ambience and social atmosphere are also emphasised by different lighting (type of lamps, positions, directional and colouring effects) (see Chapter 5, section 6). Carpets and floor coverings are described in Chapter 6, section 3, and the overall aspects of design are examined in Chapter 5.

4.02 Curtains and drapes

As a rule, two kinds of curtaining are used:
 — open mesh curtains for daytime privacy, sun filtration, light diffusion, screening exterior,
 — heavy drapes for evening warmth, privacy and intimacy.

Curtains and drapes add to the decorative effect (texture, colour, pattern) and interest (in methods of folding and hanging). Depending on the weight and thickness (lining) curtains can improve window sound insulation (by some 3–5 dBA) and thermal insulation (by 30–50 per cent). The colours and patterns of curtains may be chosen to contrast with the adjacent walls or to coordinate with other decorations.

4.03 Open mesh curtains

Sheer and net curtains include voiles, woven nets, warp-knitted nets, raschel and lace nets. Special safety nets have also been developed which

capture splinters of flying glass in the event of an explosion.

Semi-sheer curtains utilise coarser yarns, often with textured or fancy yarns, with woven or raschel constructions to provide open and solid areas in various patterns. Reflective textiles are designed to act as solar filters using reflective coating films.

4.04 Heavy curtains and drapes

Curtain materials cover a wide range of choice including:

- solid-colour plain-weaves,
- textured effects,
- jacquard and dobby weaves including damask styles,
- checks, stripes and bordered styles,
- pile fabrics (velvets, etc).

Yarns may be made of cotton, wool, acrylic, polyester, viscose and acetate, or glass fibres. Blended yarns are often used to combine properties.

Curtain materials are generally woven to standard widths and need to be made up in lengths with suitable seams and hangings. Lining is important to improve hanging, appearance, light resistance and insulation. Weights need to be sewn in the seams of curtains to improve hanging.

- Key considerations include:
- *draping quality appearance*: hanging and folding characteristics,
 - *density of weave*: retention of shape and strength of seaming,
 - *colour fastness*: to light, washing, cleaning, pollution,
 - *appearance retention*: under operating conditions, including attracting dust,
 - *cleaning*: care labelling, methods, dimensional stability, cleaning *in situ*,
 - *flammability*: flame retardant treatment, permanency, fire regulations,
 - *yarn fibres*: properties, strength, durability,
 - *pattern*: balance, matching, folding effects.

4.05 Blinds

Blinds may be required for solar control on an intermittent basis.

They include Venetian, roller and vertical blinds fitted internally and awnings and solar screens used externally. Decorative awnings also give an attractive external appearance and air of liveliness. Materials for blinds may be fully or partly translucent.

The same considerations apply as in specifying curtains and drapes.

4.06 Table linen

The use of table linen involves considerable investment and laundering costs. Fresh, well-laundered linen enhances the feel and quality of

the table and the presentation of food. It also provides protection for the furniture and clothing (napkins).

Table linen should meet exacting requirements. It must:

- wash well at high temperatures to remove stains,
- retain dimensional stability and colour,
- be of a crisp, attractive appearance.

The traditional fibres such as linen, cotton and linen-cotton twist yarns are still widely used. New easy-care fabrics include polyester fibre-flax, acrylic fibre-flax and pure acrylic fibres. PVC coated colour woven and printed fabrics may also be employed.

Linen is a natural fibre of flax which is long, smooth, straight and almost solid, giving good resistance to soiling and abrasion, high density, lustre, strength and weight, but has a poor resilience and easily creases. It is used in high quality table cloths.

Cotton consists of short natural fibres which are moderately strong and produces tight yarns with a slightly raised surface which soils easily, tends to leave a deposit of lint and has a low resilience which produces creasing. Cotton is the most common fabric material in catering used alone, in 'union' with linen (typically 60/40) or blended with rayon.

Viscose rayon is pure regenerated cellulose which is highly absorbent and has a relatively low wet strength and resilience. To provide greater strength rayon is normally blended with cotton for table fabrics.

Nylon (polyamide fibre) and Terylene (polyester fibre) are synthetic filaments which have high elasticity and strength, good durability and resistance to creasing, moisture and staining. Terylene is less affected by electrostatic dust attraction and sunlight than nylon, and may be combined with cotton (67/33) to give a more conventional appearance.

Properties of fibres may be modified by treatment such as mercerisation of cotton and linen to form smoother sheened fibres with increased strength and affinity for dyes.

4.07 Selection of fabrics for table use

Key considerations in selecting table linen are:

- appearance, weave, colour and pattern – appropriate for the decor, sophistication and style of operation,
- strength and durability to withstand heavy use and regular laundering,
- resistance to soiling and fading (colour fastness),
- ease of replacement matching and repair,
- quality of finish, edging and stitching.

4.08 Weaves

A fabric is woven by interlacing a weft yarn under and over parallel lines of warp yarn. The characteristics of the fabric will depend on the types of fibres used, the thickness of the warp and weft yarns, variations in weft spacing and the closeness of the weave.

Standard weaves used in table linen are the plain weave and the figured or damask (fancy) weave.

In plain weave, the weft passes alternately under and over the warp yarn to give a smooth surface. Decorative variations include:

- dyed threads woven in as bands of contrasting colour,
- thickening of warp and weft yarns at intervals,
- thick yarns loosely woven in softer coloured cloths.

Variations not widely used for table linen but common in furnishings and uniforms include:

- twill, herringbone or denim, in which the weft spacing is varied to produce strong dense weaves.

More complex patterns are woven in the cloth using a Jacquard or Doby loom particularly:

- damask, a patterned satin weave (using traditional or custom designs). Good quality single damask has about 5.5–7 threads/mm² (140–175/in.²) with a linen cloth weight of 0.19–0.20 kg/m² (5½–6 ounces/yd²).

4.09 Non-woven fabrics

The development of spun bonded nylon and spun laced polyester fibre in needle-punched material has led to large scale production of table cloths of a semi-durable nature.

Wet laid polyester-fibre or polyester fibre-viscose blended filaments entangled in a predetermined pattern form strong unbonded sheet structures which handle and drape like textiles.

The fabrics are strong (when wet and dry), wash and wear well, are durable, dimensionally stable, wrinkle resistant and recover their shape quickly.¹ They are also used as a substrate for vinyl laminated tablecloths.

Felt, formed from a mass of fibres bonded by heat, moisture and pressure, is often used under the tablecloth.

4.10 Stocks

Quantities.

As a rule, for each table cloth or napkin in use five

¹ O'Shea, M., 'Interior Furnishing,' *Textile Progress* Vol. 11, No. 1, The Textile Institute, 1982.

others will be required, to allow for collection, washing, return, resting and reserve. Hence the minimum requirement of table linen is six times the number of tables (cloths) and place settings (napkins).

Replacements.

20 per cent per year replacement (i.e. a five year life cycle) is usually allowed.

Marking.

Motifs may be embroidered or woven into the cloth. For effective stock control articles must be marked for identification (including date of purchase).

Storage requirements.

These depend very much on the size of the establishment and the extent to which linen is used elsewhere:

- in a hotel a linen room is essential with facilities for storage, sorting, checking and repairing. A large hotel may have its own laundry or a group of hotels may use a centralised service,
- in most restaurants laundry work is contracted out and linen stored in cupboards. The trend is towards linen hire.

Essentials of storage

- easy access with adequate space and lighting to allow inspection, separation and rotation of linen,
- warm, dry, airing cupboards,
- avoidance of stained wood, iron and other possible sources of marking and risk of damage by tearing,
- access for cleaning and smooth interior surfaces which can be kept clean and free from infestation,
- space for storage of dirty linen, sorting and checking items.

4.11 Place mats

Place mats provide an individual setting which can be used to add to the theme and character of the restaurant or company branding. The mats may be textiles (chunky double plain weave), bonded or vinyl-coated for easy cleaning after use. Machine or transfer-type embroidery motifs may be used with coordinated napkins.

4.12 Disposable materials

Unless table cloths can be frequently replaced,

for cleanliness it may be better to use exposed table tops with place settings and disposable napkins. Disposable squares or coverlets may also be used over textile cloths to reduce soiling.

Disposables are relatively cheap and available in a wide variety of colours and patterns. Overprinting with corporate designs is feasible and can be used to promote particular products (on place mats, etc). Disposables may be used for informal meals (lunch, breakfast) and can be substituted by traditional linen for evening dining.

4.13 Textile care

All textiles supplied should include detailed specifications as to the composition, compliance with relevant standards (such as British Standard specifications) and instructions for washing, cleaning and ironing. Instructions are generally standardised with washing and ironing instructions clearly marked by symbols.

4.14 Uniforms

Uniforms serve a number of purposes:

- for work tasks, cleanliness, hygiene,
- to distinguish staff from customers,
- symbols of staff hierarchy,
- to continue the theme of design and decor,
- to promote a corporate image and style.

Uniforms must be seen as part of the overall concept of design. Sets of uniforms may be coordinated for all premises operated by a company or they may be specific to each restaurant.

Alternative approaches to uniform design include:

- coordinated mix and match outfits, allowing individual variations from day to day to give less uniformity while retaining an overall standard of appearance,
- entertainment costume uniforms, creating a social atmosphere, interest and characterisation (e.g. Pizzaland, Beefeater restaurants). Uniforms may also be used to emphasise particular features (chef's table, cocktail bar, ethnic character),
- minimum provision in the form of tabards or pinafores covering the individual's own clothing,
- variations in style of meal service, such as themed coloured uniforms during daytime, formal black and white in the evenings,
- disposable items such as tabards, aprons and hats.

4.15 Materials

Materials for uniforms must be hard-wearing, easy to clean and launder regularly, colour fast and shrink resistant. The uniforms must be comfort-

able to wear and practical for the type of work involved.

Winter and summer weights may be provided.

Fibres for uniforms are usually blends such as polyester and cotton (65:35 per cent), a combination which gives comfort, durability, crease resistance, easy laundering and a smart appearance.

Materials may be constructed in plain or fancy weaves such as twills and checks. The twill weave gives a firm, close fabric formed by the weft yarn crossing the warp at different intervals.

5. Menu design

5.01 Formulation

The type of menu to be offered must take into account the basic guidelines formulated for the business, namely:

- objectives of the company (or organisation responsible for the service),
- financial policy (prices, gross profit margins, cost structure),
- marketing policy (target customers, standards, preferences, trends),
- operational policy (type of food products, method of production and service),
- employment policy (employee skill, numbers, conditions of employment),
- specific strategies (for expanding markets, introducing new products, etc).

This applies equally to any proposed changes in menu structure or coverage. Business frameworks are set out in Chapter 2.

5.02 Presentation

Menus are an essential part of merchandising, serving not only to attract interest and inform

Clubhouse for Non-Members, Kirkcaldy, Scotland

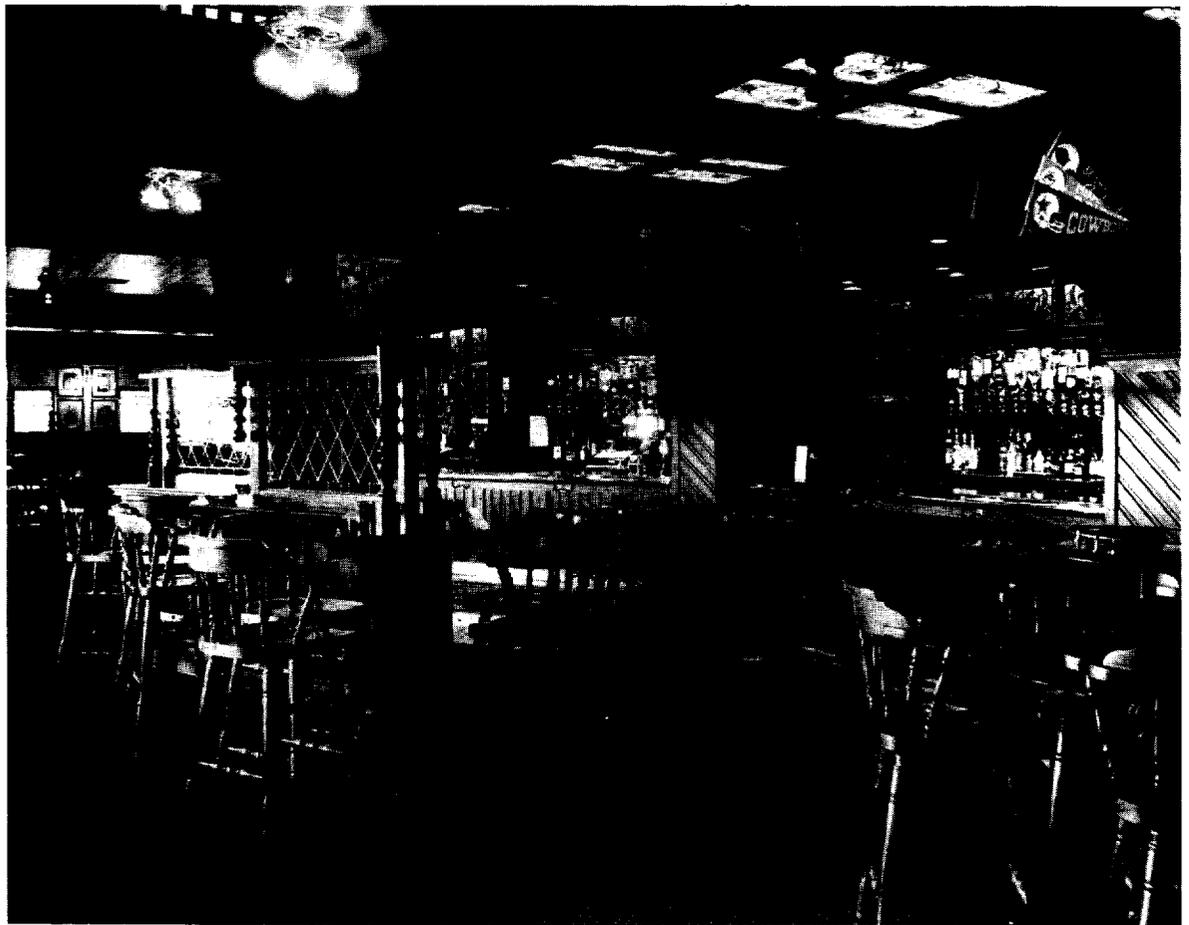
Based on a 1950s American sports club and crammed with Victorian and Edwardian memorabilia (a), this converted pub provides a restaurant on the first floor designed on the lines of an American diner. Seating 50, the first floor has been made into a balcony with a large void to provide visual linkage.

Conversion costs were £265,000.

The menu has been designed as a souvenir and offers charbroiled hamburgers, steaks, Mexican food, home-made pasta, kebabs and salads.

Designers: McCulloch Associates

Client: Alloa Brewery: a division of Allied Breweries



customers about the choice of food and prices, but to encourage decisions to be taken and, later, to reinforce confidence by putting customers at ease.

Customer behaviour and the psychology of choice are considered in Chapter 3.

The menu, including prices, must be presented in at least two instances, for example:

- point of entry: outside the premises, in the lobby or near the entrance,
- place of choice: over counter line, on display boards, or at tables.

Cross advertising with an indication of menu style may also be used in other parts of hotels, shopping malls, departmental stores or leisure centres.

<i>Presentation method</i>	<i>Points for consideration</i>
Displayed board Photographs	Limited to selected dishes – fast food, fixed or set menus. High visual impact, conveying instant information. Usually inflexible but daily choice or special promotions may be featured. Photographs must be representative.
Menu board display Chalkboard	Expresses informal atmosphere, personality of the patron and individuality of menu. Limited to particular situations. Written menus are easily changed but must be neat and stylish.
Printed or assembled	For self-service counters and others offering a choice. The position, size and design of the boards must be in keeping with the type of establishment.
Table menus Place mats Displayed cards	May be appropriate for coffee-shops and limited menus, including special promotions (for children, drinks, etc). For a fixed or regular menu which is frequently handled, cards must be protected by transparent cover or laminate and be stiff enough to keep their shape. The card may be vertically folded (centrally or in parallel) to stand upright, or a flat sheet (with or without a holder). In popular restaurants, selected dishes may be illustrated for promotion. A simple modern typeface is normally used
Special shapes	Tent, pyramid or cut-out cards may create interest
Banquets, functions	Individual menu cards are prepared for each occasion and printed and folded in a distinctive style, perhaps displaying the symbol of the client's company, etc.

Menu folders	For <i>à la carte</i> meals and more elaborate presentations, menus may be enclosed in protective folders (leather, vinyl) designed and embossed to reflect the style of the restaurant. Complementary folders are used for wine lists.
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5.03 Principles

Whatever their style, menus must be attractive and interesting as well as informative. Depending on the type of establishment, the following principles usually apply for menus:

Appearance	Cleanliness and freshness are essential. The menu reflects the standards of the establishment and is subject to frequent handling and close scrutiny
Style	The style of menu, graphics, colour, size, shape, quality of paper, typeface and language must be in keeping with the design of the premises and the marketing strategy. Artwork can be used to illustrate the name or theme of the restaurant and to create a formal or friendly relationship with the customer
Information	Details must be legible, comprehensible to the type of customer involved (both food choice and prices) and set out in logical order
Description	Food descriptions must be accurate (legal requirements), without errors or corrections. If in a foreign language it may be appropriate to include a translation. Correct terminology must be used, preferably with upper and lower case to distinguish names and garnishes
Explanation	Employees in contact with customers (table service, bar service) must be instructed on menu content, its characteristics and special features
Length	Depending on the type of establishment and its reputation, the menu should not be over-elaborate (confusing, embarrassing) or too short (insufficient choice)
Balance	The menu must be correctly balanced (in type of food, variety of choice, relative heaviness, range of flavours and tastes)
Special needs	Consideration may need to be given to nutritional requirements

Types of menu	<p>(welfare services), dietary constraints (vegetarian, slimming, low fat, low salt) and family options (children's menus)</p> <p><i>À la carte</i>: listing (lined up along the margin) of individually priced dishes, usually set out in order of appetisers, soups, eggs, fish, entrées, grills, roasts, cold meats, vegetables, potatoes, salads, desserts, savouries, cheese, fresh fruit in season. Alternatives are normally printed in the same size lettering but special items (cold buffet, dessert trolley) may be emphasised. Long preparation times must be indicated. An <i>à la carte</i> menu is usually fixed for 3–6 months but special seasonal dishes or a <i>table d'hôte</i> alternative may be individually attached.</p> <p><i>Table d'hôte</i>: inclusive price for a meal of two or three courses, each with a limited choice. Menu choices are conventionally positioned centrally in vertical line clearly separated into courses.</p> <p><i>Limited menu</i>: (coffee shops, cafeteria, counter meals) the individual dishes are usually described (often also illustrated) and priced separately. Suggestions may be offered (special dishes, children's meals).</p> <p><i>Ethnic menus</i>: the composition and structure should follow traditional lines but guidance may be given on suitable combinations, degree of spiciness, experimentation, etc</p>
Prices	<p>Prices must be set out in a way which can be clearly understood by the customers concerned. Alternative dishes of similar price must be perceived to represent equal value. Individual prices should be set to allow a range of expenditure. Any additional charges (service, cover charge, minimum charge, local taxes) must be clearly indicated</p>
Promotion	<p>Daily selected menus or special dishes may be attached to or inserted in the standard printed menu. The most prominent position is usually the top half of the right-hand page. Promotions and campaigns may be directed towards high profit-making dishes, seasonal foods, image or reputation building or trial additions to the standard range</p>
Wine lists	<p>Wine menus or lists must be compatible with the range and variety of food (including regional dishes)</p>

Menu printing	<p>and the presentation style of the menu.</p> <p><i>Full lists</i> (<i>à la carte</i> restaurants) are usually in looseleaf form in folders, <i>Restricted lists</i> (mid-market and speciality restaurants) may be on card or in a simple folder.</p> <p><i>Bar lists</i> include both displayed prices and cards for table use</p> <p>Printing involves difficulties in deciding how far ahead to stock (print run, costs) to allow for changes in content and prices. The basic design and artwork may be printed on blanks for long-run stock and over-printed in batches with updated menus and prices as required. Daily changes are usually duplicated. Alternatively, fixed menus may be printed in short runs to cover anticipated periods of use without change. Individual prices may also be changed by printed overlays or transfers (on menu boards and cards)</p>
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5.04 Food presentation and display

The presentation of food can help interest and encouraging impulse buying. It is also used to illustrate the quality, composition and, in some cases, the method of preparing dishes. Examples include:

- display of raw fish and meat (steak bars, sushi bars),
- counter displays of prepared food (snack bars, pub catering),
- trolley or table display of cakes, pastries, sweets (patisseries, cafés),
- featured displays or baskets of fruit, salads, cheeseboards,
- buffet displays of food or speciality foods (carveries).

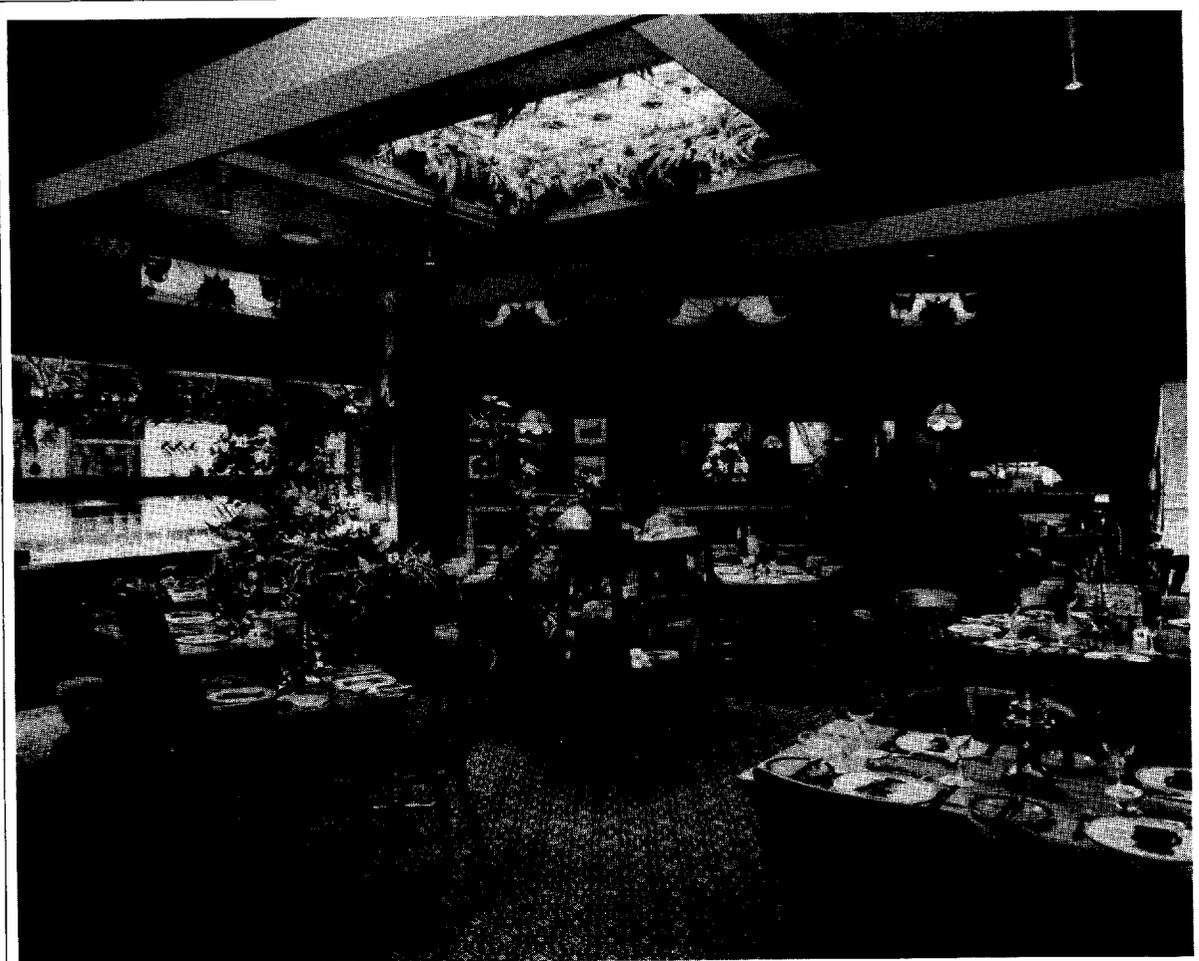
Details of food service requirements are provided in Chapter 9.

Essentially, the temperature of the food must be regulated (by refrigerated shelves, controlled heat) and the food must be protected from contamination (dust and sneeze guards) and frequently changed or replenished to maintain freshness.

6. Tableware

6.01 Tabletop requirements

The range and quantities of chinaware, glassware, and metalware required for restaurant use can be considerable. In addition to the high cost of the initial investment the costs of replacements, dishwashing and storage increase with the numbers of items used.

**Alleyns Head, Dulwich**

This typically 1930s-style public house was totally refurbished in 1984 and now incorporates a conservatory extension to the restaurant as a carvery. Solid timber panelling has been used in conjunction with pine furniture and extensive planting to provide a light, airy interior.

Developed by: Charrington and Co. Ltd
Photographs: L P A International

Table items occupy the most conspicuous area in the restaurant and are probably representative of the quality of food and drink served.

In drawing up specifications or selecting tableware, consider:

- *rationalisation*: careful analysis of menu requirements and standards to determine the range and numbers of tableware items required,
- *consistency*: decisions on the style and quality of tableware to suit the design of the restaurant and image to be projected.

6.02 Ceramics

Glazed tableware items are manufactured from refined clay, blended with other ingredients, which are moulded or shaped and fired in a kiln at about 1,200°C to produce the body of the item known as 'bisque' ware. A thin coating of siliceous material is applied which, on refiring, fuses to form a hard, glazed surface.

Decoration may be applied by hand, transfers or lithographs under the protective glazing (under-glazed), or on the glazing by refiring at fusion temperatures (on-glazed), or melting temperatures (in-glazed). On-glazing may be necessary for certain decorations (gold, bright colours) but is generally less durable. The term 'china' is traditionally applied to all glazed tableware, which include the following products.

Bone china is made from china clay (kaolin) and Cornish stone intermixed with up to 50 per cent calcined bone to give great strength, impermeability and fineness of moulding. Bone china can be produced in fine, delicate shapes.

Metallised bone china, developed specifically for the hotel and catering industry, contains added metallic oxides to provide a more resilient bond with a greater impact strength.

Felspathic porcelain has a vitreous, semi-translucent body which is cream or grey in colour and is made from a mixture of white clay, feldspar and silica. Although non-porous, porcelain tends to be more brittle.

Vitreous or vitrified china is similar in composition but includes alumina as a flux to increase the fusion, strength and impermeability.

Earthenware is made from a mixture of clay flint and Cornish stone which can be fired at lower temperatures giving a porous cream body which is less strong than vitrified ware.

Vitrified earthenware contains more flint and is fired at higher temperatures, producing a stronger fused body.

6.03 Selection of china

The main criteria used in selecting china are as follows:

- *quality*: bone china is used for delicate shapes and high quality table settings. Vitreous

china is widely used in commercial restaurants, — *standards*: resistance to crazing (with rapid changes in temperature), impact strength and maximum porosity of the unglazed body may be specified,

— *costs*: the overall costs-in-use must be considered, taking into account durability and replacements,

— *durability* will be affected by design (e.g. thickening of edges) and glazing processes,

— *damage*: chipping, cracking and damage to the surface glaze will be affected by handling and washing procedures. Soft metal (stainless steel, aluminium) can cause surface marking,

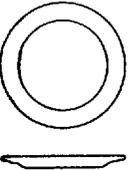
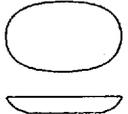
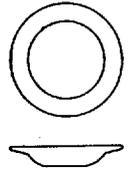
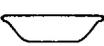
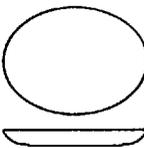
— *decoration*: patterns may be specifically commissioned but this will add to cost and stock replacements. Crests could involve delays in aligning place settings. Generally, continuous bands of decoration around the rim are preferable,

— *temperature range*: special consideration must be given to oven-to-tableware and flame proof items,

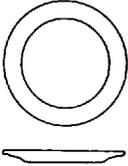
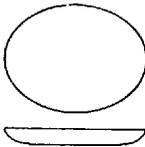
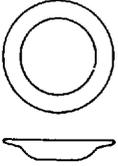
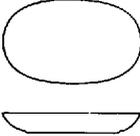
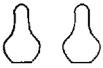
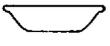
— *shape*: shapes of tableware must take account of visual, functional and operational aspects of use, for example:

Features	Examples
Interchangeability	To reduce the number of items, allow easier storage and flexibility in use, e.g. lids, plates
Replaceability	Standard designs with repeat production
Functional features including storage	<i>Hollow ware</i> : recognisable shapes, efficient pouring spouts, firm fitting lids, protection against chipping, shape and protection of handles, ease of cleaning, stability, simplicity of outline for easy washing <i>Cups</i> : design to avoid excessive cooling, allow nesting and fit machine baskets; handles – suitable strength of jointing, position, effectiveness <i>Flatware</i> : when stacked weight must be born by rims not the bases (scratching); rolled rims for strength
Appearance	Visual appeal of shape appropriate for restaurant

- *imperfections*: individual items must be checked for faults, for example, crazing of the glaze – resulting from incorrect firing; exposed dry edges – where glazing is incomplete; uneven glaze thickness – caused when draining prior to firing; voids and holes in the glaze surface; distorted shapes and uneven rims; irregularly or inadequately fixed handles, and badly fitting lids.

	Plate with rim 16 cm (6 1/8 in.) 18 cm (7 in.) 22 cm (8 3/4 in.) 25 cm (10 in.)			Oblong tray 23 cm (9 in.)			Jug 10 cl (3 oz) 20 cl (6 oz) 40 cl (12 oz) 50 cl (18 oz)	
	Soup plate with rim 22 cm (8 1/2 in.)			Salt Pepper			Jug covered 40 cl (12 oz) 50 cl (18 oz) 95 cl (33 oz)	
	Soup cup lugged 40 cl (12 oz) Soup saucer			Bud vase 13 cm (5 1/4 in.)			Sugar bowl 8 cm (3 1/4 in.) 8 cm (3 1/4 in.) continental	
	Bowl 15 cm (5 1/2 in.) 17 cm (6 1/2 in.)			Butter dish 11 cm (4 1/4 in.)			Tea cup Triton 21 cl (7 1/4 oz) Tea saucer	
	Bowl salad 20 cm (7 in.) 23 cm (9 in.)			Salad crescent 21 cm (8 in. x 4 in.)			Tea cup continental 16 cl (5 1/2 oz) Tea saucer	
	Dish oval 29 cm (11 in.) 36 cm (13 in.)			Square dish 10 cm (4 in.)			Teapot 40 cl (12 oz) 50 cl (18 oz) 80 cl (26 oz) 95 cl (33 oz)	
	Sauce boat 40 cl (12 oz) Sauce boat stand			Butter pat 7 cm (3 in.)			Demi-tasse can 10 cl (3 1/2 oz) Demi-tasse stand	
				Egg cup				

Based on Wedgwood Triton design. Sizes of glasses and bottles.

	Plate with rim 16 cm (6½ in.) 18 cm (7 in.) 22 cm (8¾ in.) 25 cm (10 in.)			Dish oval 29 cm (11 in.) 36 cm (13 in.)			Jug 10 cl (3 oz) 20 cl (6 oz) 40 cl (11 oz) 55 cl (18 oz)	
	Soup plate with rim 22 cm (8½ in.)			Oblong tray 23 cm (9 in.)			Jug covered 95 cl (33 oz)	
	Consomme cup lugged 20 cl (7 oz) Consomme saucer			Salt 10 cm Pepper 10 cm			Sugar bowl 6 cm (2½ in.) 9 cm (3½ in.)	
	Soup cup lugged 30 cl (10 oz) Soup saucer			Salad crescent 21 cm (8 in. x 4 in.)			Bud vase 13 cm (5¼ in.)	
	Bowl 15 cm (5½ in.) 17 cm (6½ in.)			Ravier 15 cm (6 in. x 3½ in.)			Tea cup Gordon 19 cl (6¾ oz) Tea saucer	
	Bowl stone edge 17 cm (6½ in.)			Square dish 10 cm (4 in.)			Tea cup Carlton 17 cl (6 oz) Tea saucer	
	Bowl salad 20 cm (7 in.) 23 cm (9 in.)			Butter dish 11 cm (4¼ in.)			Demi-tasse can 10 cl (3½ oz) Demi-tasse stand	
				Coffee pot 40 cl (12 oz) 55 cl (18 oz) 90 cl (33 oz)			Teapot 40 cl (12 oz) 55 cl (18 oz) 80 cl (26 oz) 90 cl (33 oz)	
							Egg cup	

Examples of typical shapes and sizes of china tableware.
Based on Wedgwood Connaught design (traditional shape).

Trends in tableware

Changes in fashion are reflected in the popular choice of fine china tableware, as illustrated by the experience of Wedgwood Hotelware.

Period	Shape
Late 1960s – early 1970s	Stackability, durability and practicality stressed – uninteresting cylindrical shapes common
1970s	Trend to more interesting shapes, less symmetrical
Early 1980s	Shape more significant than decoration, octagonal/hexagonal shapes fashionable
<i>Decoration</i>	
1960s	Swinging 1960s bright colourful mauves, purples, blues
Early 1970s	Symmetrical, hard designs
Mid 1970s	Heavy decoration but more delicacy
Late 1970s	Small delicate flowers, pretty, soft colours
1980s	Even more delicate, soft mist colours
<i>Plate size</i>	
1960s	10 in. standard size
Late 1960s	Emphasis on portion control 9.5 in. common
1970s	Return to 10 in. standard
Early 1980s	Nouvelle cuisine – increase in size 11–13 in. Mid-range 10¾ in. standard
<i>Hollow ware (tea and coffee sets)</i>	
Sizes	For portion control 12, 18, 24 and 36 oz pots
1960s	Traditional use of silverware
1970s	Switch to stainless steel
1980s	Trend to bone china sets – popularity of afternoon tea in USA

Current changes reflect the influences of design (soft delicate colours) and the decline of nouvelle cuisine.

6.04 Number of items

The number of tableware items required depends on the possibilities of standardisation and interchangeability. Particular restaurants in, say, a hotel may include their individual style of tableware as part of the design theme.

As a rule, an additional 1½–2 times the peak quantity of china needed for immediate use will be taken into reserve stock (total: 2½–3 times peak numbers). This will need to be increased if there are delays in replacements (e.g. special designs).

The range of items will be determined by menu requirements, including speciality items, standards of sophistication in service and grouping of customers. The range and sizes of tableware in general use are indicated below.

Other items to be considered include salad dishes (often crescent shaped), egg cups, butter dishes, ash trays, and serving dishes with flat or raised covers (interchangeable), salad bowls, sauce boats, multi-purpose bowls and speciality dishes. It is now probably exceptional to provide more than twenty different items of china for any restaurant.

6.05 Glassware

Glass is produced from sand (silicon dioxide) combined with other substances which produce characteristic properties, and heated to a very high temperature to form a molten mass. This may then be blown or moulded to shape and allowed to cool and solidify by carefully regulating the temperature (annealing). Handles and other parts are attached by welding during this process.

Type	Range	Size traditional	Metric(a)
Pots (related to cups and pint sizes)	Tea	15, 20, 30, 40 oz	430, 570, 850, 1,140 ml
Jugs	Coffee, hot milk/water	10, 20, 30, 40 oz	280, 570, 850, 1,140 ml
	Cream	1, 1½, 2½ oz	30, 40, 70 ml
	Milk	5, 10, 15 oz	140, 280, 430 ml
Cups	Tea	6, 7, 8 oz	170, 200, 230 ml
	Coffee (demi-tasse)	4 oz	110 ml
Saucers	Size related to cup but should be interchangeable		
Plates	Side	6½, 7 in. diam	165, 180 mm
	Dessert	7½, 8 in. diam	190, 205 mm
	Fish-dessert	8½, 9 in. diam	215, 230 mm
	Meat	9½, 10 in. diam (b)	240, 255 mm
	Oval meat	9½, 10 in. long	240, 255 mm
Bowls	Cereal/fruit	6, 6½ in. diam	155, 165 mm
	Sugar	3½ in. diam	90 mm
	Soup	8½, 9 in. diam	215, 230 mm

(a) Rounded to nearest 10 ml and 5 mm. (b) 10 in. is usually maximum size for a dishwashing machine.

6.06 Types of glass

The various types of glass used for catering utensils and tableware include:

- soda lime glass – contains sand, soda ash and limestone as the principal ingredients. Used for inexpensive glassware,
- lead crystal – includes sand, red lead and potash which produces a slightly softer glass of high brilliance. The surface is usually cut to produce prismatic effects and sparkle.
- borosilicate glass – addition of borax increases hardness and heat resistance and this glass is used for flameware,
- tempered and toughened glass – by tempering glass can be made more resistant to the effects of heat and this is the normal treatment applied to ovenware glass and glassware generally which needs to withstand heavy usage.

Glass surfaces may be decorated by cutting to produce sharp grooves, etc, which increase internal reflection; sand blasting to texture the surface; acid etching to produce obscuration and patterns or for badging; engraving by grinding wheels to provide patterns; or surface-printing with decorative patterns from transfers during annealing.

6.07 Selection and use of glassware

- range of stocks – multi-purpose use where possible,
- matching suites – glassware items should be basically matching in design,
- functional aspects – smooth, simple robust shapes; width of opening for washing; efficiency of draining, drying, pouring and stacking,
- manufacture – clarity of glass, freedom from cracks, faults, bubbles, distortion,
- replacement – availability of supplies.

Storage requirements for glassware must be examined in the light of the large surface areas needed and the divergent use of glasses in bar and dining area. Specially designed hanging racks and trays may be used for glasses to facilitate handling.

Consideration must also be given to glass washing facilities which may be kept separate from the main dishwashing area to avoid heavy soiling. Marking by lime scale is more conspicuous on a glass surface than on other glazed ware, and care should be taken in selection of water softening apparatus.

6.08 Numbers of items

The range of glasses used in hotels and licensed restaurants is usually extensive. Some – for

example, liqueur and brandy glasses – are specifically associated with particular drinks, while others may be interchangeable to some extent, particularly in certain sizes. The degree of sophistication in glassware will greatly depend on the type of restaurant, and variety of drinks sold, but rationalisation in glass shapes and sizes is desirable. Typical sizes of glasses in common use:

Purpose	Capacity ml(a)	Fluid oz
Liqueurs	35	1¼
Port and sherry	70, 85	2½, 3
General wine and spirit	140, 190, 225	5, 6, 8
Brandy	155, 340	6, 12
Beer and lager (½ pint)	285, 340	10, 12
Beer and lager (1 pint)	570	20
Tumblers (water, squash)	225, 285, 340	8, 10, 12

(a) Rounded to nearest 5 ml.

6.09 Metalware

Metallic tableware items include serving flatware and covers, hollow ware such as dishes and beverage containers, cutlery and table appointments such as cruets. Traditionally, these are described as 'silver', although a wide variety of metals may be used.

Metalware items are stronger, more resilient and lighter than ceramic. The choice of material is influenced by:

- traditional use of silver, associated with sophisticated standards of dining,
- risk of tainting of food, requiring tinned linings to containers made of copper,
- difficulties of washing and maintaining a good appearance due to corrosion, staining, scratching, etc.

Materials for use in food service are practically limited to silver plate, stainless steel, chrome plate, tinned copper and aluminium.

6.10 Characteristics

The particular features of metalware used in food production and service are summarised below.

Copper is decorative, an excellent heat conductor and good quality cooking utensils may safely be brought to the table. Its main characteristics:

- table or sideboard heating may be required (rapid cooling),
- copper must be kept lined with tin or silver (contamination of food),
- exterior surfaces require frequent cleaning (tarnishing, darkening),
- copper utensils tend to be heavy,
- copper surfacing may be combined with other metals.

Aluminium is widely used for utensils. It is light, non-tainting, reasonably resistant to acids and stain and a good heat conductor. Its main characteristics:

- tends to lack visual appeal (soft, easily scratched and dulled),
- low elasticity and strength (easily dented, damaged, distorted),
- may mark china surfaces (marks difficult to remove),
- properties can be improved by alloys, anodising or burnishing the surface,
- mainly used in inexpensive utensils, large containers and covers (lightweight).

Stainless steel has about twice the strength of mild steel and an inherent resistance to corrosion due to the formation of a non-porous film by oxidation of chromium and iron. The composition depends on the properties required.

Its main characteristics:

- stainless steel can be polished or produced in eggshell or satin lustre finishes,
- surfaces are resistant to staining by contact with food or detergent,
- marking can result from hard-water scale, strong bleaches, silver cleaners, scouring and overheating (removed by repolishing),
- water repellance less than glazed or enamelled ware (surface smearing),
- dull grey colour and appearance (restaurant image).

Silver plate is usually produced by depositing a film of silver by electrolysis on to a blank of nickel silver (EPNS). Ten per cent nickel is preferred for strength. Stainless steel body may also be plated and copper decorative items. The quality is largely dependent on the thickness and evenness of the silver film. This may be deliberately increased over points of wear or table contact (backs of spoons, etc). Standards are quoted in polished plate thickness (μm).

Its main characteristics:

- silverware has a rich lustre which may have a polished or satin finish,
- surfaces tend to be scratched and dulled by rough handling (soft metal),
- tarnishing may result from sulphide (exposure, foods such as eggs, onions, sauces), salt and other chemicals,

Typical quality silver plate	Thickness μm	Notes
High grade plate	35	
Good standard	20	BS 5577 for cutlery, heavily used items
Flatware, hollow ware	10	For light use or in hotels where replated frequently

For Sheffield plate, the traditional pennyweight (dwt) of silver per dozen is still widely used, for example:

Items	dwt/12 items,	
	Heavy	Good standard
Main course spoons or forks	30	20
Dessert spoons or forks	20	14
Teaspoons	10	7

- frequent cleaning (burnishing, chemical cleaning) is needed to maintain lustre,
- for hotels and where in intensive use, replating may be needed at regular intervals to restore appearance.

6.11 Uses of metalware

Cutlery

A wide range of manufacturer's cutlery patterns is available in traditional and modern styles. The numbers of different cutlery items depend on the type of establishment:

Hotel, traditional	} cutlery items (excluding servers) per seat multiplied by seat turnover per meal
restaurant	
Popular and limited menu	

For stocking of cutlery the figures are, generally 2 times the number of items in regular use, and 1½ times the items less frequently used.

Features to be taken into account in selecting cutlery include:

- quality – of plate or composition,
- balance – in size, proportion, weight,

Type	Typical composition			Properties/uses of stainless steel
	% Carbon	% Chromium	% Nickel	
18/8	0.08	18	8	Austenitic but hard, tough, abrasion resisting, highly ductile. Used for utensils, hollow ware
18/10	0.05	18	10	
Cutlery	0.20	13	Vanadium (optional)	Martensitic but cannot be welded. Used for knife blades and cutting edges

- design – in keeping with character of meal and surroundings,
- durability – bearing in mind use, methods of handling and washing,
- stackability – with minimum of scratching,
- knife edges – serrations, retention of sharpness,
- handles – materials and method of fixing,
Handles may be of solid steel, hollow plate, nylon, xylonite, or compressed wood (rosewood) and may be in one piece with the blade or fitted with a bolster or rivets.

Serving items

Items for food service generally fall into two groups, hollow ware – tea and coffee sets, dishes and covers, tureens and bowls, etc, and flatware – shallow dishes, plates and trays. Their main characteristics are:

- dishes and hollow ware may be round, oval or rectangular in shape and are in suitable ratios of size,
- if a lid is provided, it must fit well, be tall enough and preferably interchangeable for versatility in use,
- edges of trays and dishes may be plain or wrapped for rigidity,
- components may be sold separately or combined, e.g, tureen and cover, gravy boat and stand,
- generous provision must be made for serving spoons, ladles, etc.

Table appointments and accessories

General items include condiment sets, finger bowls, stands, napkin rings and menu holders. Table vases and lamps or candleholders may be in complementary style. Specific requirements may apply for ethnic and family food service (individual and communal dishes, trays, integral burners, fondue sets, etc).

Badging

To prevent theft, tableware may be distinguished by badge marking with the name or symbol of the establishment. Methods of badging metalware include etching (electrical burning), stamping (impressing) and engraving (cutting).

6.12 Plastics

Use of plastic tableware is still very limited in general catering practice, partly because of unfavourable consumer reaction and partly because of the difficulties of maintaining a satisfactory appearance (damage by scratching, scuffing and heat).

The main applications are in:

- trays, holders, prepared dishes (cafeteria service),
- food containers, boxed and packed meals (in transit feeding),
- disposable cutlery, cups, containers (vending machines, take-away service).

The general advantages of plastic materials include their relative cheapness, suitability for mass production, properties which combine strength, rigidity or flexibility with light weight, impermeability, low noise, good heat retention, stackability and compact storage.

The materials most commonly used are melamine – in white or coloured mouldings, laminates and surfaces giving a tough durable finish – and polystyrene, for which there is a wide range of uses:

Type	Use
Thin sections	Cups for vending machines, inserts for polypropylene holders, plates and trays in plain and compartmented shapes
Thick sections	Bowls, cutlery, dishes
Translucent	'Glasses' for cold drinks, jugs
White opaque	Normal appearance for plastic items
Coloured	Items in limited plain colours
Expanded	Stiffer mouldings, light in weight and with good insulation properties

6.13 Disposables

Examples of the use of disposables are given in Chapter 8, section 5.02.

7. Accounting and control

7.01 Control

The management of food and beverage services is concerned with maximising revenue and controlling costs. Both involve the introduction of procedures for recording and analysing information and the setting up of budgets or targets in order to compare actual performance against the intended levels. Control is essential to ensure correct pricing and standards, to reduce waste and fraud and to monitor changes in sales and costs. Although the complexity of control systems will depend on the type and scale of operation, five main areas must be covered.

Sales

- sales information: type and volume of sales

related to days of week, times of day, seasonal variations, etc, for forecasting sales and monitoring changes,

— revenue control: procedures for billing, checking orders, handling revenue and balancing accounts.

Production

— menu costs: yields and sizes of portions, standard recipes and costs, food and beverage cost percentages and gross profit mark-ups to determine selling prices,

— inventory control: records of purchases, specifications and price variations, quantities and value of stocks.

Labour

— labour records: work schedules and rosters, employee details, conditions of employment, wage rates and benefits, means of determining labour costs.

7.02 Equipment

Much of the information required for forecasting and controlling revenue and performance can be obtained at the point of sale. Depending on the type of restaurant, procedures for taking and recording orders and preparing individual checks may be based on the following systems:

Type of equipment	Examples of applications
<i>Manual systems:</i> sales transactions hand-written on duplicate or triplicate checks for transfer to the kitchen, bar and cashier. Used with a cash till or register	Full service restaurants with high staff ratio
<i>Pre-checking system:</i> orders entered directly into a keyboard which automatically prints each sales check with a duplicate and retains a tabulated record of all transactions. The keyboard may be pre-set or pre-priced	Full service restaurants. Popular catering
<i>Electronic cash registers:</i> allow a wider range of functions including sales analyses. ECRs may be installed as stand-alone or linked systems	Store restaurants. Cafeteria, bars
<i>Point-of-sale control systems:</i> have separate keyboard terminals in the restaurants linked to remote printers or VDUs in the kitchen, bar, etc. The equipment may interface with hotel accounting systems	Hotels. High-volume restaurants

Computerised systems: enable a number of serving terminals, intelligent tills and remote printers to be controlled by a master unit containing a central processor, memory and power unit. Most systems are compatible with standard computer hardware (256k RAM or 512k RAM, 360k or 1.2m disk capacity) and can interface with other systems. Depending on software, the functions may include menu planning and costing, gross profit reporting, stock control, re-ordering and forecasting, VAT returns, payroll, crew scheduling and accounts

Fast-food units. Hotels. Chain restaurants.

Satellite stations: provide remote terminal links by telephone to a central processor to enable sales performance to be analysed (usually overnight) and reported back

Fast food. Chain operations. Franchised units

Menu reader terminals: can be used to scan hand-marked forms such as menu cards for transmitting meal requirements, printing records and controlling meal assembly. Interfaced with computer system for dietary and recipe analysis

Hospital conveyor systems. Fast-food units

7.03 Outside or off-site catering

Contractors may also operate outside catering services for events such as garden parties, fêtes, sporting events, shows, exhibitions and functions. The arrangement may be to provide specified meals for an agreed number of customers or to provide refreshments generally on a concessionary or chargeable basis.

Requirements for outside catering usually involve the preparation, transport and service of food and beverages, including any furniture and equipment needed.

Requirements	Considerations
Services	Hot and cold water supplies, drainage, electricity and gas may be available on a permanent or semi-permanent site. In other cases water containers, pressurised gas cylinders, burners and generators will need to be provided with extra costs and restrictions
Equipment	All equipment, glassware, china, etc, will need to be supplied and transported, this involves high insurance and handling costs

Preparation	As a rule most of the food preparation is carried out in advance in a central production kitchen to ensure higher standards
Marquees	Usually hired for the occasion by the client or financed through additional catering charges
Catering units	Specialist caterers may provide purposely designed units brought to, or erected on, the site, complete with equipment and built-in services for coupling to mains
Control	Standards of cleanliness, hygiene, storage and security depend on efficient organisation
Staffing	Skilled, experienced staff are required to supervise and coordinate any casual labour
Losses	High risks are liable to result from inclement weather, breakages, misuse and depreciation of equipment

8

Food Production Facilities

1. Methods of food production

1.01 Food production

Requirements for food production vary widely and this will affect the amount of equipment and space needed. Specific provision should be made for:

- storage of commodities and prepared food,
- preparation of food for cooking, with separate areas for food served direct,
- cooking of food including end-cooking/regeneration of pre-cooked items,
- serving of hot and cold meals or cooling/chilling/freezing for distribution or later use.

1.02 Production planning

Food production must be considered as an integral part of the food service operation. Some of the key factors which affect planning and equipment specifications may be summarised:

Considerations	Planning implications
Objectives in providing food services. Type of operation and market orientation	Type of food products, standards of sophistication and range of choice. Influence decisions on location (site costs, space needs), type of production and serving equipment and labour requirements (see Chapter 4, section 5.03)
Financial policies: criteria for investment, capital and operating budgets	Affect the types of equipment used and method of financing (purchase, hire or rental) Emphasis may be given to capital cost reduction or subsequent savings in operation (using more sophisticated equipment)
Catering policies: type of food products, method of purchasing, extent of preparation on the premises (see Chapter 2, section 5.02)	Provide guidelines on the system of production and distribution (see sections 1.04–1.10) including the type of storage and preparation facilities, range of equipment and space required
Planned menus: details of food products and range of choice to be offered (see Chapter 6, section 5.01)	Determine production requirements, including details of the preparation, cooking and serving equipment most suitable. Other options may be considered (alternative supplies, dual purpose equipment)
Times of service: peak and non-peak rates of demand, affecting the quantities of food required and variations in output	Together with menu plans provide the basis for equipment specifications (type, output, performance standards) and labour requirements (work scheduling, duties, rosters)

Labour availability: difficulties in recruiting skilled labour. Employment policies (shift and part-time work, training)

May strongly influence planning of food production, placing greater reliance on convenience food, self-controlled equipment and systemisation of production than on traditional skills

1.03 Rationalisation

Essentially, production must be geared to the style and scale of operation. The objectives in planning and organisation are to ensure that the menu requirements of prepared and cooked food are available in prime condition at times and in quantities which will meet the expected rates of demand, without there being unacceptable delays and without food being kept too long, with consequent loss of quality.

This involves an analysis of:

- the preparation and cooking processes required,
- alternative equipment and output capacities,
- the cooking (or regenerating) cycles involved,
- arrangements for phasing production with rates of demand.

Operations can be rationalised and better coordinated by adopting a more systematic approach, for example:

Microcomputer based food planning and costing systems

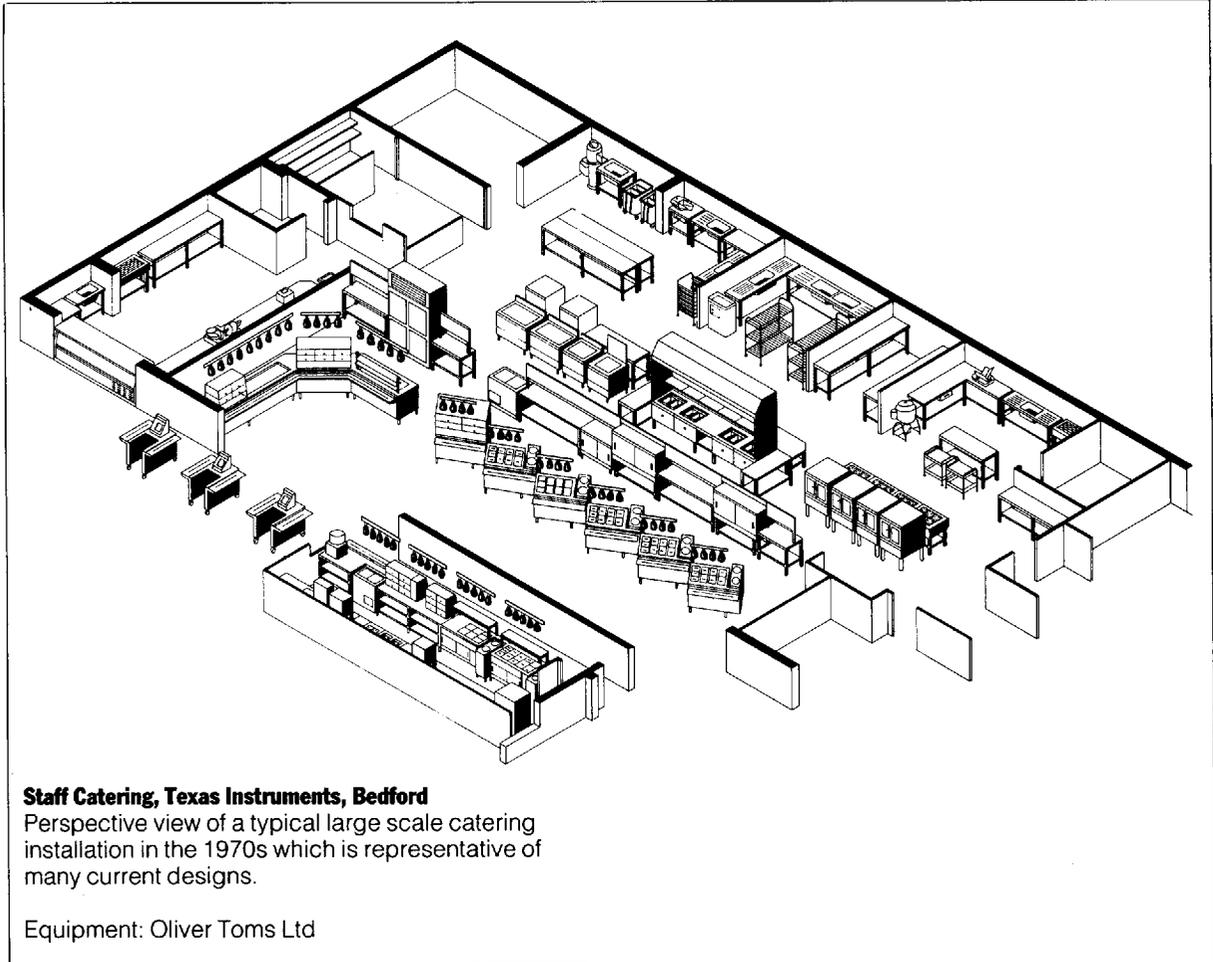
- preparation of standard recipes with details of quantities, yields, costs, preparation and cooking programmes and gross profit margins,
- variations for social and welfare needs, including stock control, budgeting and nutritional analyses.

Simulation and process planning

- simulation of demand including variations in arrival rates, times required for service and seat occupancies to ensure better use of equipment and staff (see Chapter 4, section 2.03),
- process flow planning of the stages and times involved in food production to improve layouts and methods of operation (see section 3.12).

Systemisation of production

- reduction of the amount of preparation at the point of service (where space and time are usually at a premium) by preparing the food in advance (see section 1.04).
- use of conveyerised equipment, continuous cooking equipment, interchangeable containers to transfer food, multi-function programmed equipment and other processes to reduce handling and delay.



Staff Catering, Texas Instruments, Bedford
 Perspective view of a typical large scale catering installation in the 1970s which is representative of many current designs.

Equipment: Oliver Toms Ltd

Rationalisation is made possible by more clearly identifying the menu requirements and the particular characteristics of each type of operation. This can be illustrated by the following examples:

<i>Type of operation</i>	<i>Menu rationalisation</i>
Fast-food units	Concentrated on a few highly standardised products
Popular restaurants	Short, regular menus with simplified preparation
Mid-market restaurants	Wider choice may include convenience food items
Non-commercial catering	Cyclical menu with standardised recipes

1.04 Food production systems

The systems of production of food fall broadly into four main categories:

- conventional or direct: food prepared in individual kitchens as required,
- commissary: part of the preparatory work centralised,
- central production: food prepared in advance then chilled or frozen,

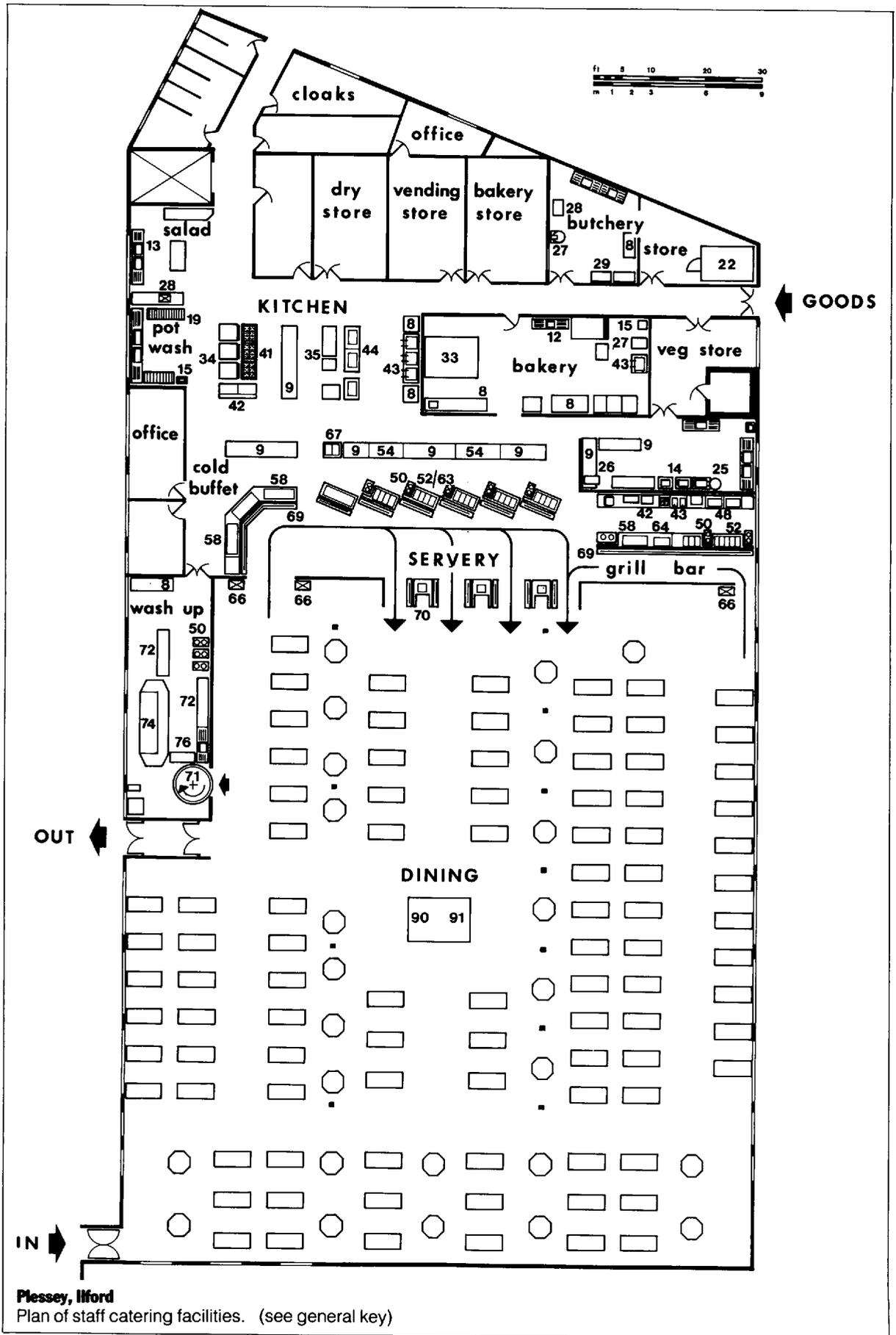
- assembly-serve: ready-prepared convenience foods used.

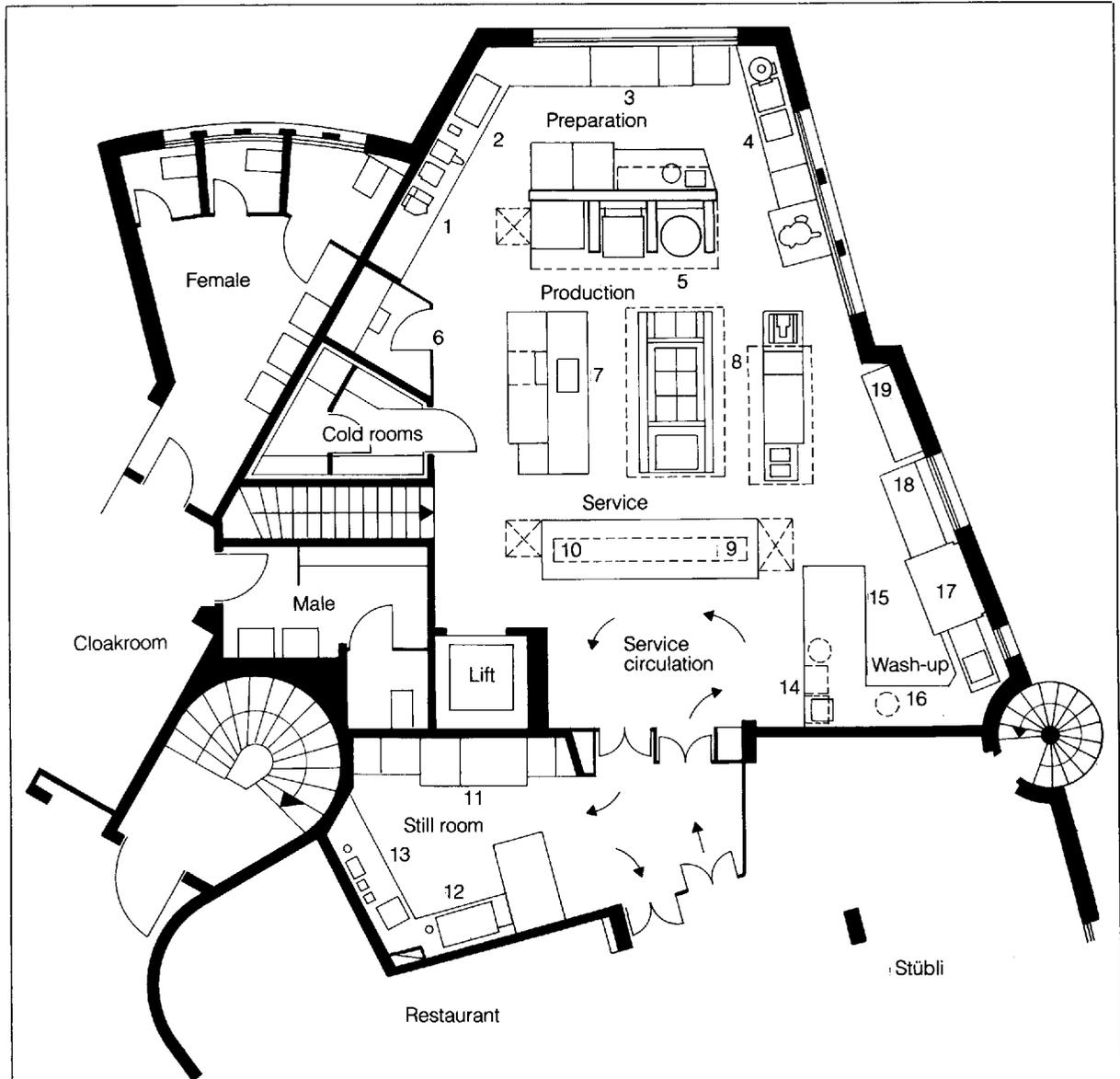
These distinctions are often blurred. Large kitchens designed for conventional production may include cook-chill facilities to enable the work to be more easily organised and to supply prepared meals for special needs (banquets) or non-working periods (weekend, night shift). Assembly-serve systems may include convenience food prepared centrally or directly purchased from suppliers.

1.05 Conventional or direct systems

Conventional kitchens are generally planned on autonomous lines with storage, preparation, cooking and serving facilities within the same operational unit. There is usually flexibility in the type and extent of food preparation carried out, and the cooking equipment employed is invariably of general purpose design. Space savings are possible by:

- rationalising the menu, using part convenience food to supplement local fresh food supplies,
- increasing equipment utilisation, for instance by part preparation of food in advance during off-peak periods,





Kongress Hotel, Davos, Switzerland

Opened in December 1982, the 160-bed Kongress Hotel has a ground-floor kitchen with typical French layout. Storage rooms and staff feeding areas are located in the basement.

Food service consultants: Therma Grosskuchen AG
 Clients: Kongress Hotel, Davos

Preparation area

- Service circulation
- 1 Cold meat preparation
- 2 Cold dishes, coupes, glaces
- 3 Pastry preparation
- 4 Vegetable preparation

Main production area

- 5 Boiling pan and bratt pan on trunions, with floor drainage channel
- 6 Garde manger
- 7 Rotisseur
- 8 Entremetier

Service counter

- 9 Hot service
- 10 Cold service

Still room

- 11 Wine, mineral and milk storage
- 12 Beverage counter with boiler and coffee machines
- 13 Fruit juice and milk dispensers, mixer, toasters

Dishwashing area

- 14 Soiled dish counter with overshelf and under-counter waste bins
- 15 Under-counter glass-washing machine
- 16 Rack slide with inset sink and drainer
- 17 Dishwashing machine
- 18 Pot sink
- 19 Pot rack

— locating the kitchen to serve a number of outlets.

Compared with other systems, direct kitchens are advantageous:

- for residential or employee catering where menu change and variety are essential considerations,
- for high-quality cuisine, speciality and ethnic restaurants.
- where they are linked to training needs and comprehensive tourism development projects (enabling local produce to be used and local economies to benefit),
- for many medium-scale operations (200–400 main meals/day) on grounds of competitiveness and for very large-scale concentrated service (where the use of specialised equipment is warranted).

1.06 Commissary systems

Purchasing, storage and production of some items may be concentrated in one kitchen from which freshly prepared food is distributed on a daily, or more frequent, basis to smaller finishing kitchens each serving a particular restaurant or outlet. This arrangement is most suitable for preparing food which requires special equipment or skill (butchery, bakery, confectionery, vegetable preparation) and may be used by large

hotels or hotel and restaurant chains with several outlets in the same locality.

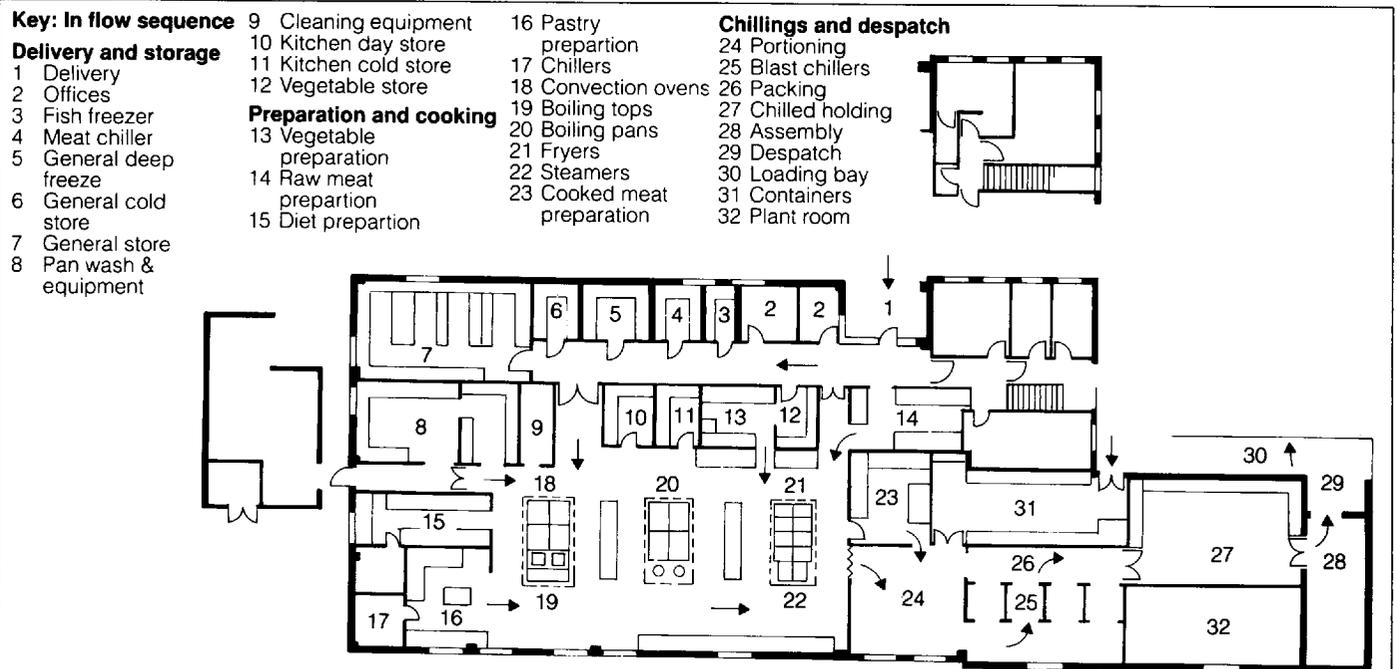
1.07 Central production systems

The objective in centralising production is to separate the initial storage, preparation and prime cooking stage from the pressures on time, staff and space which generally apply at the point of service:

- operations can be craft directed, coordinated and scheduled over the full working day,
- special equipment can be employed at high capacity and the benefits of scale used to reduce purchasing, storage and distribution costs,
- centrally produced food can be used to supply a large number of outlets, including restaurants, cafeterias, fast-food stores and vending units.

The method and time-distance of distribution requires detailed planning. Each outlet usually has a small finishing or service kitchen in which the prepared food is reheated or end-cooked and made ready for service. Space and equipment in a finishing kitchen can be reduced by 40 per cent or more and, with further rationalisation, may be incorporated into a simple back-bar servery arrangement.

Two main processes are available to facilitate separation:



Hospital, Wakefield Health Authority

This central production kitchen for cook–chill meals is planned to serve 7 hospitals within a 5 mile radius, with 88 wards, 1,774 in-patients, 296 day patients, and 4,006 staff. Installation has been phased over 18 months, with modifications to the existing end kitch-

ens. Flows through the stages of production are carefully planned.

Catering consultants: Tricon Foodservice Consultants Ltd
 Clients: Wakefield District Health Authority

- chilling to +1 to +3°C (34–37°F) to extend the use of prepared foods over 2–4 days.
- freezing to –20°C (–3°F) and below to give a storage life of several months,

1.08 Cook–chill systems

Cook–chill processes have become widely established in recent years as an alternative to freezing, particularly for use in commissary systems. Food can be chilled in a fully plated or multi-portioned state, stored for 1–5 days and reheated and served in a short period. In comparison with freezing:

- chilling can be installed in many existing catering systems with less disruption and lower capital costs,
- no change in existing technology is required; traditional recipes can be used throughout; chilling retains the quality of freshly cooked food and no delay in thawing out frozen food is involved,
- energy costs per day for chilling and holding are calculated to be one-third those for freezing and holding and energy costs for regeneration are similarly reduced.

Cook–chill systems are primarily used to enable the preparation and cooking of food to be more conveniently organised ahead of requirements when the menu choice and numbers of meals are known in advance, for example:

- hospitals (medium and long stay patients),
- residential establishments (weekend and out-of-hours services),
- conference centres, convention and banquet halls,
- in-flight catering, meals in transit,
- welfare services (extended meals service to centres and homes).

Requirements include:

- temperature of freshly cooked food to be reduced from 65°C (150°F) to 4°C (40°F) within 2 hours (1 hour using blast chilling equipment),
- storage refrigerators: holding temperature 0–3°C,
- Maximum period from production to consumption 6 days. (In practice food is cooked 2–3 days ahead of meals.),
- Typical reheating times to serving temperature (60–65°C) using infra-red or convection oven:
 - plated meals – 12 minutes
 - bulk portions – 20 minutes,
- System feasibility: minimum number of meals per day typically recommended – 500.

1.09 Cook–freeze systems

The freezing of cooked food to –20°C (–3°F) enables storage, in the frozen state, to be extended over several months. Cook–freeze systems rely on rapid freezing to minimise structural damage to the texture of the food and colour and flavour changes caused by leaching and de-

hydration. This involves:

- the use of specialised equipment for packaging and blast-freezing or other large scale techniques (cryogenic immersion or plate freezing),
- some modification in recipes and uniform portioning of food,
- for widespread distribution, refrigerated or eutectic trucks may be required in addition to insulated containers for local deliveries.

Frozen food may also be bought in from manufacturers to extend the menu range or to enable the final preparation to be simplified using less labour and skill. This is equally applicable for small- or medium-scale food-service requirements.

Large-scale cook–freeze systems are mainly limited to regional food services to hospitals, schools, universities, institutions or the forces personnel. This system generally becomes feasible for 2,000 plus meals per day.

Requirements include:

- freshly cooked (blanched food to be reduced from 70°C to –20°C (150°F to –3°F) within 90 minutes,
- storage temperature range –18°C to –22°C (0 to –7°F) depending on type of food and duration of storage,
- to control food costs storage is generally planned around:
 - 21 days – foods in frequent use,
 - 14 days – food moderately used,
 - 7 days – food regularly used,
- separate freezers should be provided for main storage and daily requirements, with separated compartments to reduce temperature fluctuations,
- typical reheating time to serving temperature 65°C (using infra-red or convection oven) bulk portions 25 minutes,
- micro-wave ovens and high intensity radiant sources require intermittent or pulsation controls to allow thawing and uniform heating of frozen food.

1.10 Assembly-serve systems

Investment in central production kitchens is generally appropriate only for large commercial companies and regional feeding services. In other cases restaurateurs may purchase ready-prepared convenience food from manufacturers specialising in wholesale production:

- the product range extends from food processed on a large scale for the domestic market to specialist gourmet supplies,
- accounting ratios are modified with increased food costs set against savings in capital investment and labour,
- convenience foods may be frozen or chilled, vacuum pouched (for boil-in-the-bag products),

sterilised in hermetically sealed containers, or dehydrated.

1.11 Food distribution

Arrangements for distribution of prepared food form an integral part of any system of central production and the transportation requirements and costs must be taken into account in assessing the system feasibility. Food distribution channels may be required to supply:

- hotels – service kitchens, pantries, staff feeding,
- hospitals – ward kitchens, staff feeding, individual patients,
- restaurants – retail outlets, fast-food units, multi-unit food halls,
- vending units – individual and combined vending units,
- in-transit feeding – flight services, rail carriages, ferry shipping,
- social feeding – remote services for employee feeding, social centres,
- home services – home sales of restaurant meals, meals-on-wheels.

Practical considerations include:

- interchangeability of containers and fittings (standard gastronorm sizes)

- Method of transport, for example:

Internal

- service elevators (location, capacity, other uses, hygiene),
- conveyor systems (costs, location, installation, cleaning),
- fitted trolleys and trucks (size, weight, circulation routes, parking).

External

- standard vehicles (insulation, other uses, hygiene),
- special vehicles (costs, extent of use, efficiency),
- distribution network, distances, journey times, possible delays,
- access, handling, cleaning and operational requirements,
- methods of temperature control:
 - Insulated containers* – for temporary holding of food,
 - Cooling in transit* – with solid carbon dioxide, liquid nitrogen spray, cooled eutectic plates or refrigerated vehicles,
 - Insulated equipment* – with integral refrigeration (and heating) for connections at the loading and service terminals,
- overall costs including labour and terminal equipment.

2. Delivery and storage requirements

2.01 External relationships

The locations of restaurants and their food production and storage areas are mainly dictated by external requirements. Relationships between functional areas must be considered at the initial stage of planning.

Facility	Location	Reasons
Restaurant	At street level	Merchandising – convenient access
	Any other levels	Vistas – space utilisation
Food production (finishing) and service	Adjacent to each restaurant	Fast, efficient service
Food storage	Convenient for delivery	Control, minimum handling or delay
Food preparation (basic)	Adjacent to storage	Confinement and disposal of waste

2.02 Flow routes

Meal production may be considered as a production process with the food passing through a series of stages – described as flow routes – which follow in sequence from the supply of raw ingredients to the final point of service for meals. Careful planning of flow routes is necessary:

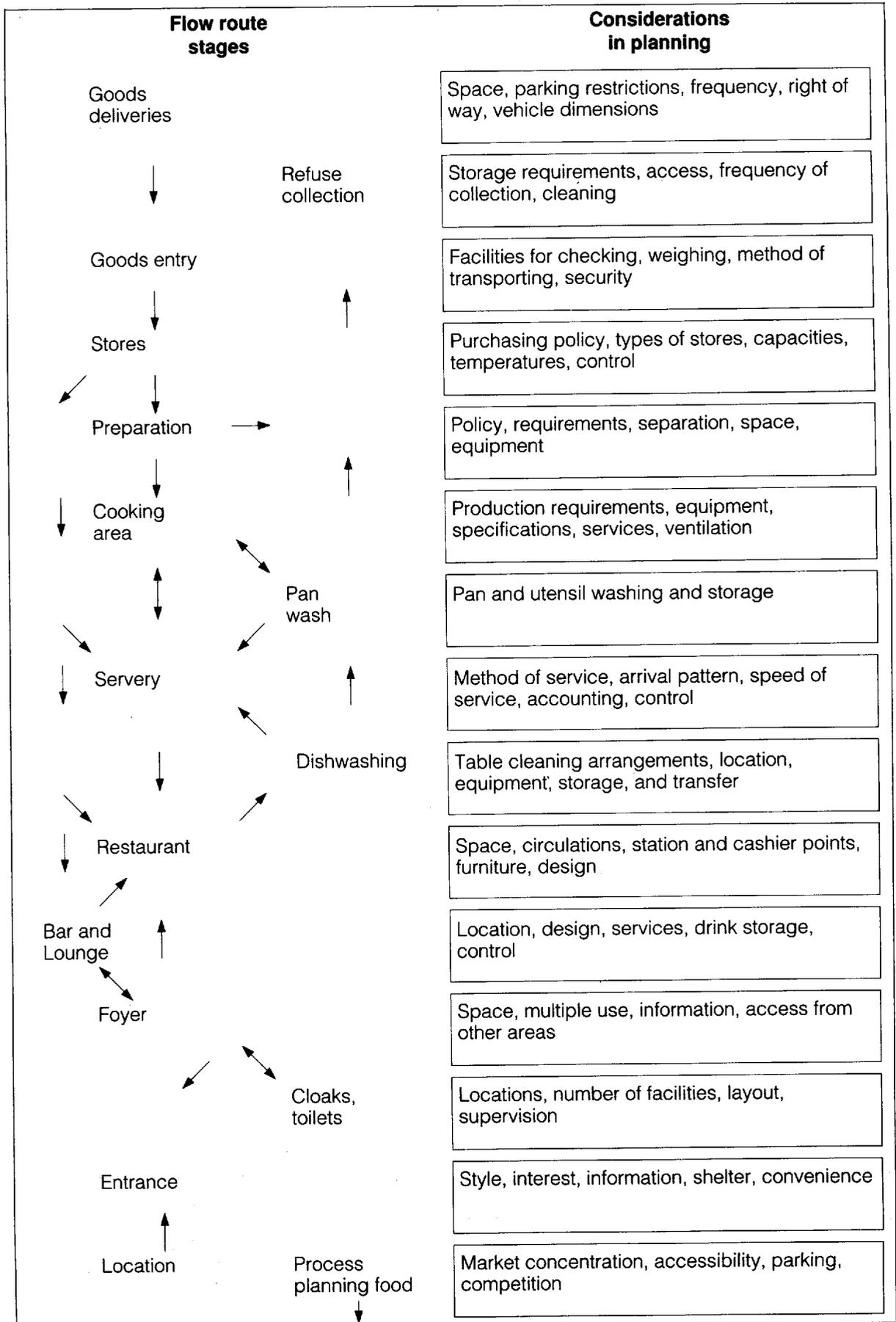
- to ensure that the correct facilities are available in their appropriate places, and
- to reduce the risks of contamination of prepared food, and of congestion and obstruction in the working arrangements.

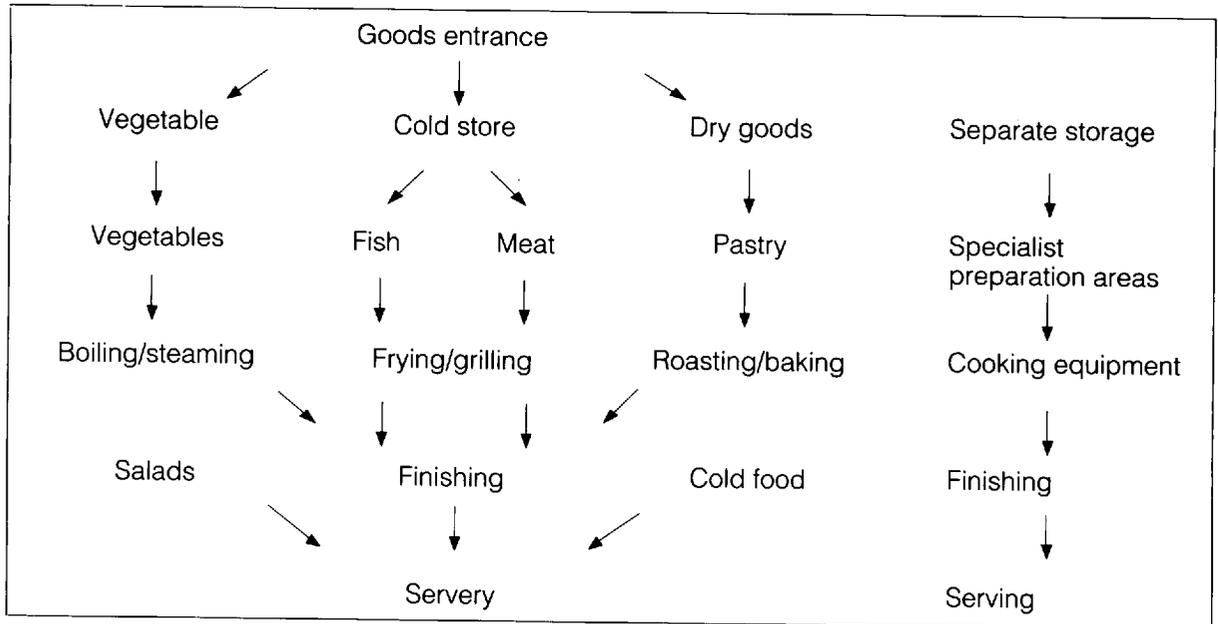
A simplified flow route diagram for food production and service is represented on p. 182

As the size increases, more specialisation, both in equipment and concentration of work, becomes necessary and this develops into a number of parallel flow routes.

2.03 Food delivery requirements

Vehicle access is required both for delivering food and other goods and for the removal of refuse and food waste and for servicing and repair work. The frequency of deliveries will depend on the type, size and location of the premises and on the supply arrangements (see section 2.07).





As a broad guide, the following arrangements are typical in an urban area:

Food commodities	Frequency of deliveries
Dry goods (canned, dehydrated)	Weekly or fortnightly
Stored vegetables and fruit	Once or twice weekly
Milk, cream, freshly baked products	Daily
Chilled food, meat	Every one or two days
Frozen food	Weekly
Waste removal	Usually once or twice weekly

2.04 Access for vehicles

Planning for goods and service vehicles must take into consideration the risk of street congestion or other restrictions to traffic:

- size of the vehicles, particularly length and turning circle, which determines the width of access roads, radii of bends and space for turning and manoeuvring. This includes requirements for refuse vehicles and fire fighting vehicles,
- waiting area for vehicles, such as service trucks,
- size and height of unloading bays and other facilities for handling and transporting food items (see section 2.06),
- weights of vehicles which may affect access road and ramp construction,
- clearance heights (of overhangs and passages) and maximum gradients.

2.05 Refuse and garbage removal

Access requirements for refuse vehicles and

storage arrangements must be verified by the local authority.

Refuse storage must be screened from view and be located so as to minimise the risk of noise and smell and the possible carry over of debris and litter.

Depending on the size of facilities, equipment to facilitate storage or handling may include:

- compaction machines for compressing bulky packaging and similar materials into bales,
- crushing machines for glass bottles for bars,
- large containers, for mechanical loading on to specialised vehicles,
- separate refuse bins – suitably labelled – for food waste intended for processing for animal feeding,
- returnable containers, which must be kept clean and separate,
- refrigerated storage for food waste to minimise offensiveness and insects, particularly in hot climates.

Constructional specifications must include the following basic requirements:

- the yard or floor surfaces to be smooth, impervious concrete or asphalt laid to falls (minimum 1 in 100) to allow effective drainage,
- drainage to be through suitably sealed gulleys fitted with strong grating,
- the floor to withstand expected impact and loading (including truck weights) without damage,
- surrounding walls to be rendered smooth with cement up to a height of 1.8 m (6 ft) and coved at the junction with the yard surface,
- refuse bins and other equipment to be placed on platforms or stands 200 mm (8 in.) above the yard surface,
- a hose and water supply to be provided for washing down,
- the enclosure to be secure against unauthorised entry and against scavenging animals.

2.06 Goods entrance

The arrangements for receiving, weighing and checking deliveries depend on the size of the premises and the relative positions of the storage areas, for example:

individual restaurant: table with weighing scales near entrance or within storage area,
large institution, hotel, multiple complex: purposefully designed and equipped unloading dock with raised platform for off-loading vehicles. Checking/receiving area adjacent leading directly to stores.

Requirements	Details
Construction	Resistant to impact, easily cleansable surfaces. External corners protected and floors may be reinforced with mesh. Flooring surfaces must be non-slip. Preferably no steps: changes in level provided by ramps with up to 10° slope
Entry to kitchen	Through draught lobby (leading to stores) to avoid air in-rush and burner flame instability
Door width	To allow for equipment, trucks, bulk containers. Minimum (small restaurant). Single doors: 1,050 mm (42 in.), preferably double doors: 1,200–1,500 mm (48–60 in.) wide, with unequal width leaves
Opening	All doors must be well hung and close fitting. For intensive use, two-way swing doors with unbreakable viewing panels and buffered meeting styles preferable. For small premises inward opening doors may have securing catches. All main doors should have self-closure devices (to prevent dust, insect, rodent and draught entry)
Door construction	Tough, durable construction with metal kicking and edge plates for main doors. Frames must also be strong and secured
Security	Fitted with bolts and locking set
Transportation	Elevators for transporting food to other levels must be in an area adjacent to the kitchen and stores (with balanced ventilation and fire resistance)
Staff facilities	WCs or urinals must not be entered directly from an area used for storage, preparation or transport of food (see Chapter 4, section 5.02)

2.07 Food storage

Food supplies may be obtained direct from local suppliers or through a central purchasing agency. In a large organisation the food purchasing specifications need to be precise in order to ensure consistency of quality and accurate long-range pricing.

For individual premises, food storage requirements depend mainly on:

- meal requirements (numbers and types of meals produced per day),
- location of premises (planned frequency and reliability of deliveries),
- company policy (purchasing arrangements, types of food used, centralisation of storage and preparation).

Changes in production methods are having a considerable effect on storage requirements, particularly the trend towards the use of prepared foods. In planning storage, a balance has to be kept between keeping an adequate reserve for emergencies, etc, and the additional costs of space and stock this represents. Stock control, ordering and rotation are facilitated by the development of computerised billing systems which, together with standardised menus, record the balance of stocks, predict replacement needs and indicate trends in menu choice.

2.08 Types of food storage

There are three main types of food storage:

Vegetable stores

- separate storage for fresh vegetables and fruit may be justified in conventional kitchens serving upwards of 50–100 meals per day,
- to confine dirt and debris stores should be located near the goods entrance and with direct access to the vegetable preparation area (see flow routes),
- the stores should be fitted out with shelves (for packaged items) and meshed racks or bins (for loose vegetables).

Dry goods stores

- a general store room or cupboard is required for dehydrated and canned foods in almost all premises,
- most packaged items can be accommodated on shelves,
- dried goods in large quantities are better kept in purposely designed bins fitted with lids and wheel bases or castors to allow them to be easily moved for use and cleaning,
- the siting and construction of a dry goods store must prevent dampness, including the risk of condensation or humid air, penetrating from other areas,

- dehydrated foods can have a shelf life of 9–12 months but stock rotation is important,
- moderate increases in temperature up to 16°C (60°F) are not normally detrimental to goods.

Refrigerated stores

- mechanically refrigerated storage is required for frozen food, chilled food, beer cellars and wine stores,
- refrigerators are also used for temporary storage of perishable foods, prepared food awaiting service.

Refrigerators may be of several types:

- *reach-in individual cabinets* with capacities of about 1.4–2.8 m³ (50–100 ft³) incorporating refrigerating equipment,
- *well type conservators* (for ice cream, frozen foods),
- *walk-in coldrooms* of 2.8 m³ (100 ft³) or larger assembled on site from pre-formed sections. In this case the compressor–condenser unit can be sited above or away from the cabinet – up to 6 m (20 ft) distance,
- *miscellaneous refrigeration* equipment including ice-making machines, bottle coolers, display cabinets and cases, vending machines and drinks dispensers.

2.09 Storage requirements

Calculations of storage space are typically based on:

- *deliveries*: 7–14 days: dried goods and frozen food. Three days: vegetables. One day: perishable and prepared foods,
- *reserve*: 100 per cent depending on arrangements,
- *food density*: dry goods: up to 720 kg/m³ (45 lb/ft³). Frozen/refrigerated: 650–480 kg/m³ (40–30 lb/ft³),
- *average storage density*: in walk-in stores, about 25–30 per cent of above. In reach-in cupboards, about 35–40 per cent,
- *quantities*: for an average meal: 450 g (16 oz) plus 110–170 g (4–6 oz) for packaging and waste,
- *shelf width*: usually 450 mm (18 in.) – up to 525 mm (21 in.) wide arranged on both sides of 1100 mm (42 in.) aisle,
- *shelf height*: lowest at least 200 mm (8 in.) clear of floor. Maximum height 1950 mm (78 in.),
- *shelf design*: preferably purpose designed metal racks, adjustable in height and movable for transport, and cleaning,
- *work bench*: located in or adjacent to stores, With weighing scales and utensils for package opening.

2.10 Construction and services: general storage areas

Interior surfaces of storage rooms must be

smooth, non-absorbent and easy to clean. As a rule the walls should be cement rendered and painted or tiled and ceilings should be sealed to prevent dust and insects gathering. The floors should be laid to falls for drainage with external gulleys.

Through ventilation, giving at least two air changes per hour, is essential (except for refrigerated space) and mechanical plenum systems may be installed for rooms which do not have an external wall. All ventilators must be fitted with insect- and vermin-proof gauze.

Artificial lighting should be designed to provide an illumination of 200 lux (20 lumens/ft²) without obscuring or throwing shadows over the shelves. Fluorescent luminaries with a natural daylight spectrum are preferable to facilitate inspection.

2.11 Conditions affecting storage

Optimum conditions for storage depend on the type and range of food, from a moderately cool dry atmosphere (for dried goods) to one which is very cold and humid, as for most perishable foods. It is generally possible to distinguish the following requirements for food storage:

Type of food	Storage conditions
Frozen food (vapour-sealed containers)	Deep freeze to –20°C (0°F), depending on length of storage required
Chilled, perishable and prepared foods	Cooled to between 1°C and 4°C (34°F and 40°F) but maintained above freezing point
Dehydrated or dried foods	Moderately cool, 10–15°C (50–59°F) and essentially dry
Fresh vegetables and fruit	Cool, 5–10°C (41–50°C), well-ventilated but with high humidity. Protected from frost and daylight. (Note: some tropical fruit, bananas, tomatoes, etc, stored above 10°C)
Green salads	In refrigerated cabinets 1–6°C (34–43°F) with high humidity (ice) to maintain crispness
Canned or bottled foods	No specific requirements but affected by extremes of temperature, humidity (rust) and rough handling (perforation, breakages)
Wines, beers	Optimum temperatures: beer 13–15°C, red wine 14–16°C, white and sparkling wine 10–12°C (see section 2.13)

To provide for these variations food storage is usually divided into separate areas.

2.12 Location and construction of cold rooms

Access to cold rooms should be through an airlock or intervening chilled area to minimise

temperature fluctuations. Refrigerators should also be sited away from heat producing equipment and the heat generated by the refrigerator itself must be dispersed by:

- good ventilation of the surrounding area,
- split systems with the condenser-compressor unit sited externally, or
- heat recovery systems to provide hot water or heated air for circulation elsewhere.

Requirements include:

- *insulation*: walls, floor, ceiling and door usually have a thermal insulation value of about 0.35–0.45 w/m² °C (0.06–0.08 Btu/ft²hr °F),
- *sealing*: outer surfaces airtight, inner linings sealed against condensation or vapour entry and easy to clean,
- *cooling*: internal cold air circulation by fan. Automatic defrosting essential,
- *capacity*: for packaged frozen food with a specific heat of 3.8 kJ/kg°C (0.9 Btu/lb°F), the average storage capacity is about:
 - walk-in cold room – 130 kg/m³ (8 lb/ft³)
 - reach-in refrigerator – 160–220 kg/m³ (10–13.5 lb/ft³),
- *height*: usually limited to about 2,100 mm (84 in.),
- *fittings*: shelving and hanging fittings must be demountable for cleaning. Doors of cold rooms must be openable from both sides.

2.13 Storage of beverages

Requirements for storage of beer, liquor, wines and soft drinks depend on the nature of the premises, its location and market emphasis. The facilities may provide for:

- draught beer, lager, etc: bulk storage and piped circulation from a cellar,
 - bottled or canned lagers, beers, soft drinks, etc: crated or boxed in the cellar or separate room,
 - wines and spirits: on racks, bins or shelves in a secure wine store or cellar, or partitioned area.
- The optimum location for stores is determined by:
- access for delivery vehicles and handling of bulk containers,
 - security and supervision,
 - proximity to serving areas (bars, restaurants),
 - constructional requirements and temperature control.

Typical locations are cellars for bulk storage – basement or semi-basement level – and stores for bottles and cans – adjacent to serving area.

Facility	Requirements
Bulk delivery- (depending on supply)	Raised unloading bays for casks and barrels. Double doors 1,500 mm (5 ft) wide. Inclined rolling ways and mechanical hoists
From tanker vehicle	Pipelines to storage tanks, with valves, ventilators, meters, etc. Protected from damage and contamination. Access for tank installation and replacement
Crate and box delivery	Direct access from vehicle dock. Swing doors at least 1,000 mm (3½ ft) wide
Security	Conditions may be stipulated for insurance. Substantial building construction. Strongly bolted and lockable doors. Lockable mesh partitions for high value stock. Entrance to wine and liquor stores through supervised area
Temperature control	Critical for beers, lagers and wines. Non-fluctuating temperature essential. Optimum range: Cellar generally 13–15°C (55–58°F) Beer, lager 13–15°C (55–58°F) White wine 10–12°C (50–54°F) Red wine 14–16°C (57–61°F) Champagne, sparkling wine 6–8°C (43–46°F) Fan-coil cooling and heating units commonly used Energy recovery to supplement hot water supplies may be feasible Pipe-lines supplying draught beer and lager may also be chilled Ice cube machine adjacent to bar Good insulation of walls and ceilings: thermal transmittance value less than 0.8 w/m ² °C (0.14 Btu/ft ² °F)
Environment	Free from tainting odours (chemicals, fuel, fumes). Optimum relative humidity 75 per cent (non-drying)
Lighting	Windows not required (security risk). Installed illumination 200 lux (20 lumens-ft ²), free from strong shadows. Luminaires moisture proof.
Beer cellars	Casks stored off the floor on still-ages, thrawls or mobile tilters. Kegs stand upright. Space for CO ₂ or compressed air cylinders or pumping plant Shelves and hooks for filters, containers, equipment Hygiene important (risk of odour taint) Sink with hot and cold water (pipes insulated) Floors constructed for heavy loading: 9.6 kN/m ² (200 lb/ft ²), durable,

	<p>impervious, smooth, with falls to accessible gully for washing down Walls smooth, hard and durable, ceilings underlined</p>
Wine cellars and stores	<p>Bottles stored horizontally in racks or bins with space for location, inspection and removal without disturbance. If only one store: sparkling and white wine kept on lower shelves (temperature gradient). Spirits usually stored with wine: bottles upright on shelves or in bins. Space and facilities (shelf, candle viewing) for checking and decanting wine</p>

2.14 Restaurant, furniture and equipment stores

The extent of space, separation and constructional requirements for other types of storage will depend on the nature and size of premises:

- large hotel, club, institution: separate rooms for stock in use and reserves of linen, silverware, china and glassware. Separate furniture store adjoining convention hall and function rooms,
- individual restaurants: storeroom or cupboard for reserves. Sideboard or separate cupboard for daily use.

Conditions for storage may be summarised as follows:

Stores	Key requirements
<i>Linen</i>	
Tablecloths, napkins and uniforms	<p>Warm 15°C (60°F), aired (2–3 changes/hr) to avoid condensation, mildew or souring. Rust staining, dust and fluff harbourage prevented. Easy access and space for laundry-baskets and boxes. Total stock 5–10 times quantity of linen in use (depending on status, extent of use and laundry service). In popular catering the trend is towards use of disposable or wipeable table mats and coverslips</p>
<i>Silverware</i>	
Cutlery, items, table appointments, serving dishes and flatware, kitchen utensils	<p>Lockable stores for reserves of silverware, stainless steel, aluminium and tinned copper utensils, etc. Equipment in daily use (+ extra 20 per cent balance) kept in sideboards, stations, kitchen cupboards or racks. Total stock 2–3 times quantity in use (depending on individual design, replaceability and special needs)</p>

<i>China, glassware</i>	
Crockery, glasses and jugs, fragile items	<p>Lockable stores for reserves (may be kept with silver). China in daily use kept in sideboards, servery and kitchen. Glasses in sideboards or bar racks. Total stock 3–4 times items in use (as above)</p>
<i>Cleaning equipment</i>	
Vacuum cleaners, cleaning materials	<p>Separate storage area or fitted cupboard. Chemical cleaners stored on impervious shelves, labelled. Daily requirements kept in kitchen. Provision for drying and ventilation important</p>
<i>Furniture</i>	
Chairs, tables, carpets, drapes, stage equipment, leisure equipment	<p>For multi-purpose adaptable use in hotels, clubs, conference rooms, banquet halls, social and sports centres. Stores positioned near hall, with direct service access. Furniture designed for easy stacking, folding and movement on trolleys, carriers or wheel bases. Easy stowage and hanging with minimum damage or fire risk. Ventilation (1–1½ air changes/hr): dry conditions. Fitted racks for special equipment – with direct access</p>

3. Production areas

3.01 Ratios of space

The ratio of space used for the restaurant dining area as compared with that occupied by the kitchen and ancillary areas (stores, offices, staff facilities, etc) varies considerably in different types of operation, and also with the frequency of use, i.e. seat 'turnover' rate of the dining room and volume of counter sales.

Example	Typical ratio of space Earning:non-earning	Notes
Family restaurant	3:1	Also most ethnic restaurants
Gourmet restaurant	2:1	Relatively large kitchen
Coffee shop	2:1	High seat turnover, higher output
Back bar, limited menu	4:1	Convenience food, space economy
Fast-food unit	1:1	High volume counter sales
Institutional feeding	3:1	Fixed number, 1 sitting per meal
Employee feeding	2:1	2–3 sittings for midday meal

With increase in scale the production area of a kitchen can be more efficiently used, representing an appreciable saving in the total area required. Thus there are economic advantages in combining the production into one main kitchen.

For restaurants, the area required per seat is not generally related to the total number of seats provided. It is determined by other considerations such as standards, seating arrangement, type of furniture and method of service.

There are usually no significant savings in providing very large restaurants, unless the area is also to be used for functions and social gatherings, and the trend is towards providing a choice of smaller restaurants supplied from one kitchen directly or via small, individual service units.

3.02 Space for equipment

In any particular kitchen there are two main demands on space:

Equipment space

Up to about 30 per cent of the floor space in a commercial kitchen is usually occupied by equipment. The aggregate work surface area of preparation tables, draining boards and benches amounts to a further 10 per cent.

Work areas

Rather more than 60 per cent of the kitchen area is normally free for working space, circulation and access. This area can be reduced to 50 per cent for small back-bar operations, ergonomically designed around the movements of the workers, but could be increased to 70 per cent or more in large hospital and institutional kitchens in which wider aisle spaces are necessary for trolleys and transporters.

3.03 Insufficient space

Congestion and problems of inadequate space are commonly due to:

- equipment: additions to original requirements, changes in policy,
- movement: obstruction of circulation by trolleys, etc,
- working: poor layout, inadequate bench space and racking,
- servicing: cleaning, access to equipment and fittings, working space,
- ventilation: inadequate temperature, air flow or balancing control.

3.04 Excessive provision of space

Excessively large areas can result in inefficient operation due to:

- extra time and energy expended in movements over longer distances,
- extended lines of communication and supervision,
- increased costs of cleaning, lighting and maintenance,
- capital costs of under-utilised space.

3.05 Determination of kitchen areas

Both the capacity of the equipment and kitchen area will be related to the total number of meals required per day over the main meal period. The ratios of average area per main meal for various outputs provide a means of estimating preliminary space requirements. However, the particular operational requirements must also be considered, for example:

- *type of meal*: less equipment and fewer employees are required to produce a simple meal of one or two courses without choice than a more elaborate meal offering a wide selection of dishes,
- *convenience foods*: finishing or service kitchens using prepared chilled or frozen food are simplified in design and reduced in area by a third or more,
- *production systems*: in fast-food operations the output of meals is more specifically related to equipment performance, particularly when this is operated on a continuous cooking basis,
- *type of establishment*: less space is required per meal in non-residential institutions (educational and employee food services) where only one main meal is involved. Similarly, meals for banquets and functions can be prepared ahead of requirements.

The average areas in a kitchen using conventional methods of food preparation are indicated on p.188 (above).

The average areas in a kitchen using mainly prepared *frozen* and *chilled* foods are indicated on p.188 (below).

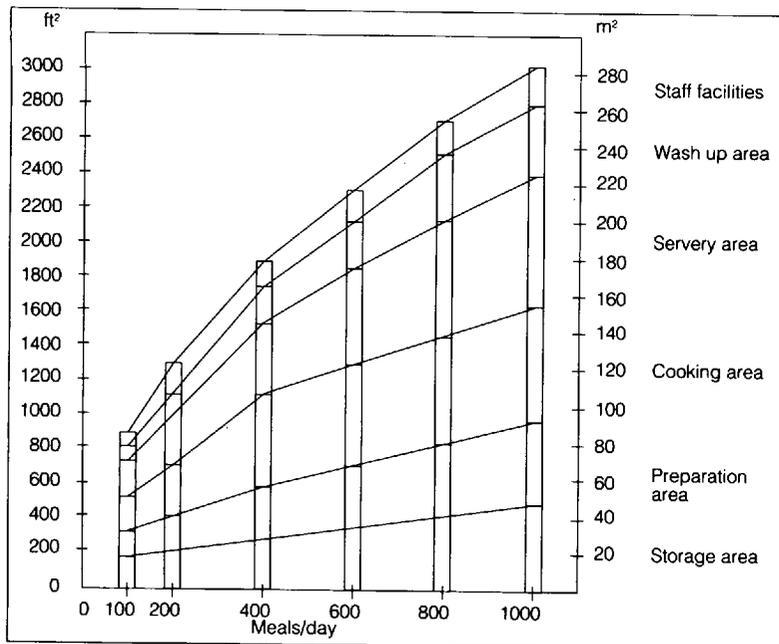
Points that are to be noted include:

- *storage*: typical requirements based on delivery intervals of:

- 1 day – freshly prepared or chilled food, dairy products,
- 2–3 days – vegetables,
- 7 days – frozen food.
- 7–14 days – canned or dried goods.

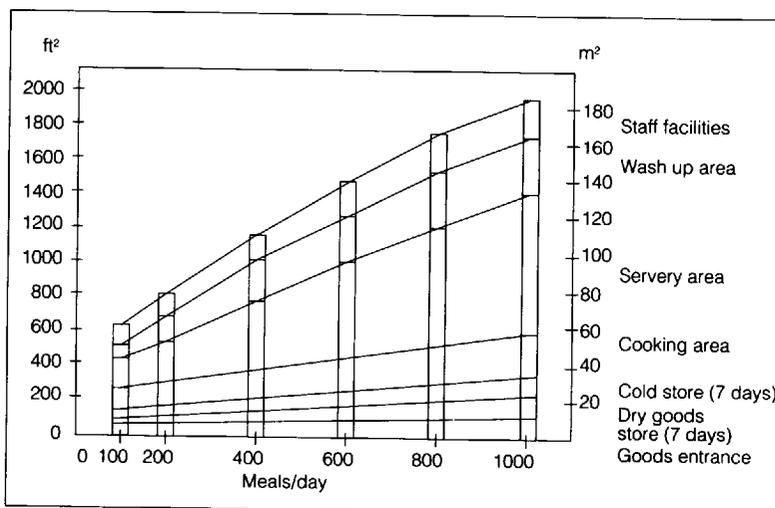
Space must be provided for unloading, weighing and checking,

- *preparation*: as the output increases, the equipment and space can be used more effectively. For very small kitchens the dimensions become critical,
- *service*: for a cafeteria service, the counter becomes part of the display and may need to be increased,
- *staff facilities*: may be grouped with other staff accommodation. In a large hotel a separate staff dining room will be required. Sanitary facili-



Conventional kitchens: ratios of total area: meal served (average)

Number of meals prepared during main meal period	100	200	400	600	800	1000
Ratio of area required: meal (ft²)	9.20	6.25	4.60	3.80	3.55	3.05
(m²)	0.85	0.58	0.42	0.35	0.31	0.28



Finishing kitchens: ratios of total area: meal served (average)

Number of meals prepared during main meal period	100	200	400	600	800	1000
Ratio of area required: meal (ft²)	6.20	4.30	2.95	2.47	2.15	1.98
(m²)	0.58	0.40	0.27	0.23	0.20	0.18

ties must be separate from any food room or workplace.

3.06 Dimensions

In deciding appropriate dimensions for equipment and work areas, account must be taken of the physical characteristics (anthropometric data) of the working population employed in the catering industry.

By using representative body dimensions as a basis for design, suitable allowances can be made for working heights and limits of reach in various work situations.

Ergonomic theory is also being increasingly applied to the design of equipment and fittings, particularly to such features as the position of handles and controls, the shapes of appliances and the sizes of utensils.

There is also a need for standardisation of equipment sizes and dimensions to facilitate interchange and replacement.

Typical dimensions for work benches, tables and shelves are illustrated.

Height

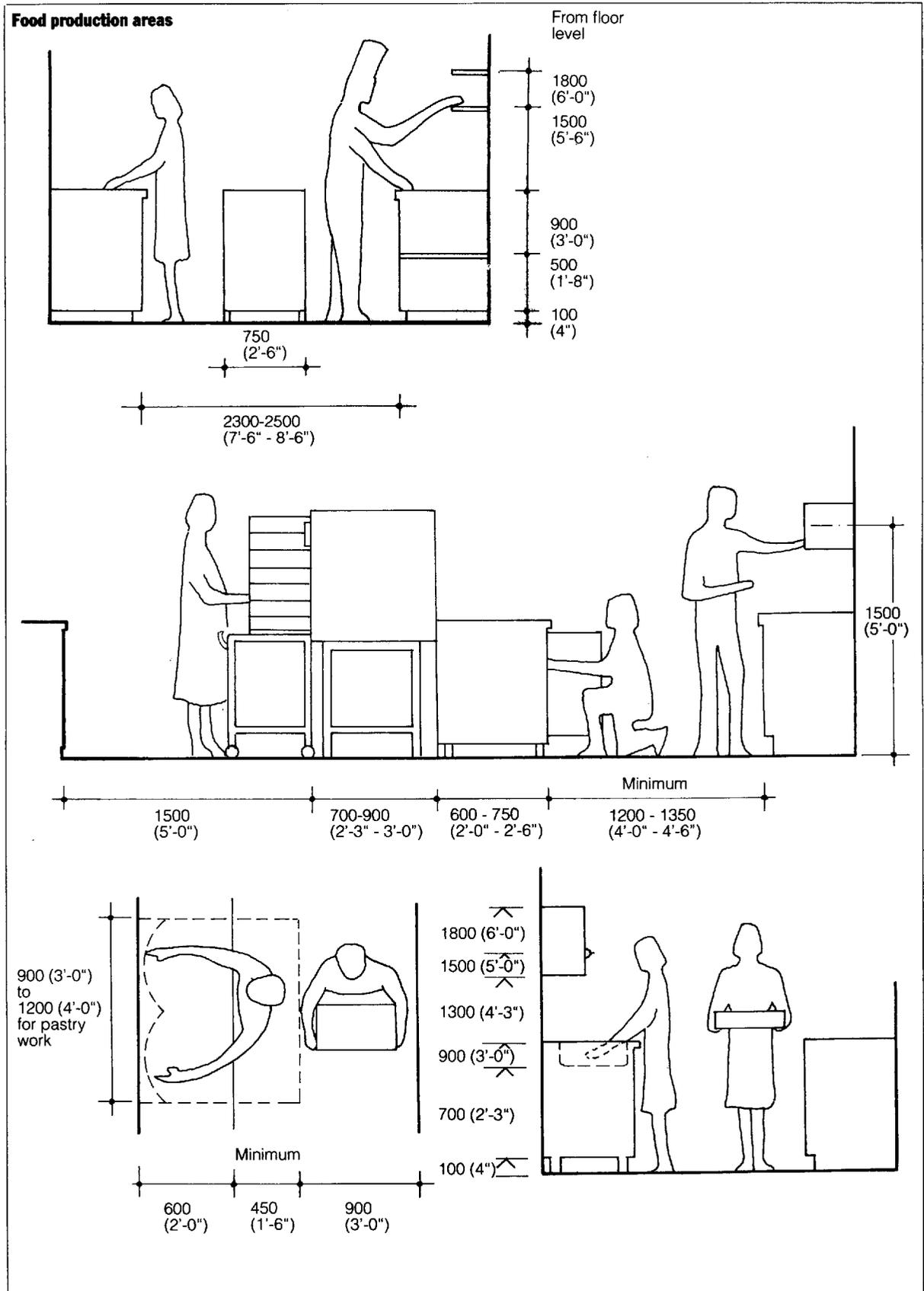
- the standard height for work tops is generally taken to be 865 mm (2 ft 10 in.),
- research indicates that a higher level is less likely to produce strain and backache with prolonged standing, and 900 mm (2 ft 11 1/2 in.) is sometimes specified,
- sink tops are made to 865 and 900 mm heights – the latter being more common,
- The heights of wall-mounted shelves are limited by the extent of forward reach required,
- in the interests of safety, shelves should not be fitted over hot equipment,
- the comfortable height of a work surface for a seated position with a seat height of 430 mm (1 1/2 ft) is about 700 mm (2 ft 4 in.), which is lower than the normal bench top level and requires a special shelf or table,
- if a higher level is provided it must be fitted with an appropriate foot rest.

Surface areas

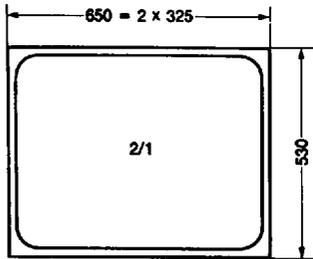
- wall benches are generally 600–750 mm (2–2 1/2 ft) wide,
- island benches and tables are usually 900 or 1,050 mm wide (3–3 1/2 ft) to allow working on both sides,
- the length of a work area – such as a bench top – within convenient reach of one worker is about 1,200 mm (4 ft),
- a work top length of 2,400 mm (8 ft) would be suitable for two people working side by side,
- stowage and working space should be allowed for bench-mounted equipment and utensils (tools, trays, containers),

— mobile benches and trolleys are used extensively in modern kitchens to reduce unnecessary walking and carrying,

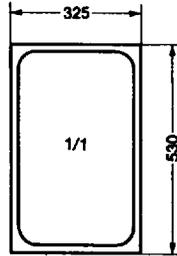
— seats may be provided in work centres where the work is repetitive and restricts movement.



Module size for gastronorm containers

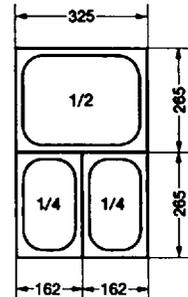
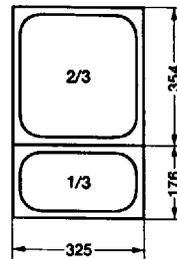
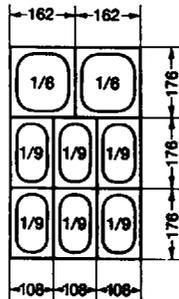


Double size 2/1



Full size 1/1

Most equipment is designed to hold gastronorm containers. Size standardisation enables food to be transferred directly from refrigerator, to transporter, to cooking equipment, to bain-marie/hot cupboard.



3.07 Grouping of equipment

The choice of alternative positions for equipment may be restricted by the shape and dimensions of the room but in most cases two types of grouping are possible:

- wall siting, with the cooking equipment arranged around the perimeter walls and work tables placed in the centre of the kitchen,
- island grouping of the large cooking equipment in the centre of the room with the work benches and other equipment adjacent to the walls.

Equipment may be free-standing directly on to the floor, mounted on a stand or bench or be supported by brackets or cantilevers fixed to the walls. To ensure accurate horizontal positioning and for adjustment into line with any adjacent equipment, levelling screws are necessary.

Although external dimensions are not standardised, equipment from the same manufacturer is usually designed so that it can be joined or butted together to form matching suites.

3.08 Wall grouping

Placing equipment against the walls allows considerable economies in the engineering services and this arrangement is usually adopted in smaller kitchens. The services are not only cheaper to install but also simpler and easier to maintain. For example:

- water pipes may run along the walls instead of over the ceiling or under the floor,
- waste pipes and channels can be kept short and discharge direct to outside gulleys,
- canopies or grilles can be fixed to the adjacent wall which, together with directional control of air inflows, enable the internal temperatures to be more easily controlled,
- with equipment arranged along the walls, the kitchen is less obstructed by canopies and pipes.

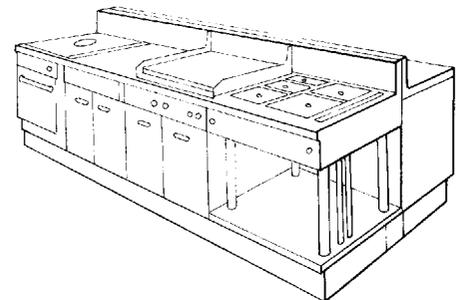
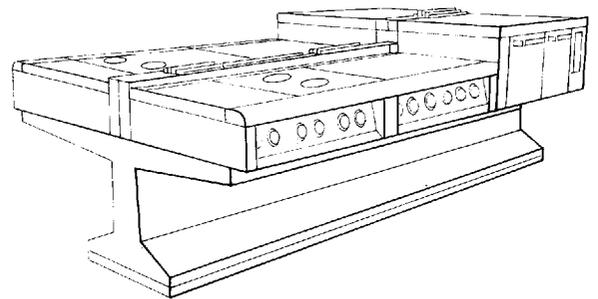
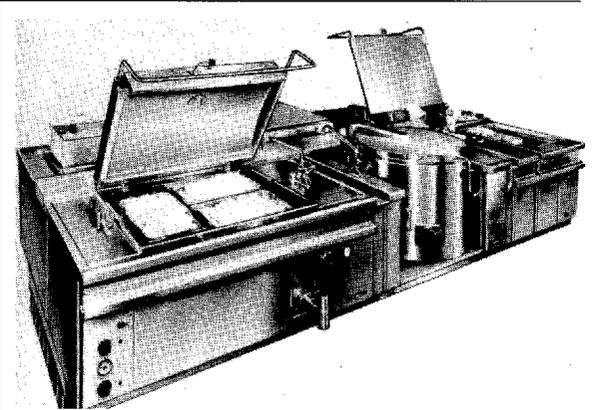
Back-bar equipment, used in snack bars and public houses, illustrates the development of a range of small equipment designed specifically for wall mounting.

Module dimensions for small back-bar units which can be mounted immediately behind the serving counter to provide visual cooking are typically 500 mm (1 ft 8 in.) or 600 mm (2 ft) deep.

An average width across a counter, aisle space and back-bar is 2,400 mm (8 ft), allowing space for working and serving behind the counter. In designing a back-bar unit, the height and relative position of equipment, working surfaces and storage for food and utensils are important.

3.09 Island grouping

In areas which cater for larger numbers, the wall perimeter is usually insufficient for all the equipment required. Island groupings are, in any event,



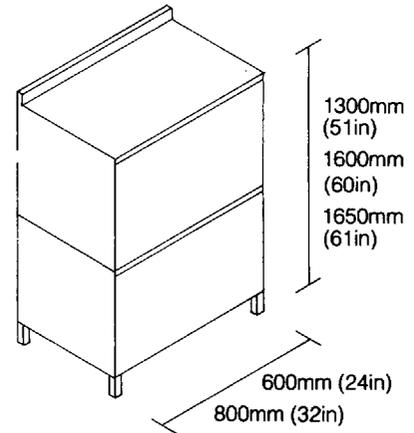
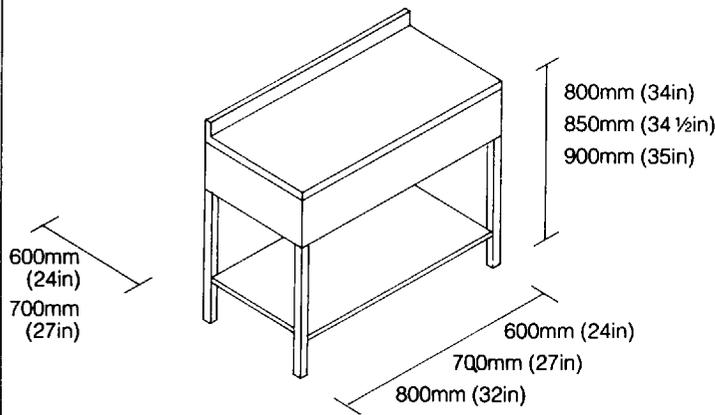
Island Grouping

Cooking equipment can be cantilevered for floor clearance and combined as suites to customer requirements. Improved insulation and temperature sensors are used to reduce energy and worker discomfort.

For large scale or highly systemised production, conveyorised equipment includes continuously operating boilers, steamers, shallow and deep fat fryers, infra-red broilers and rotary ovens.

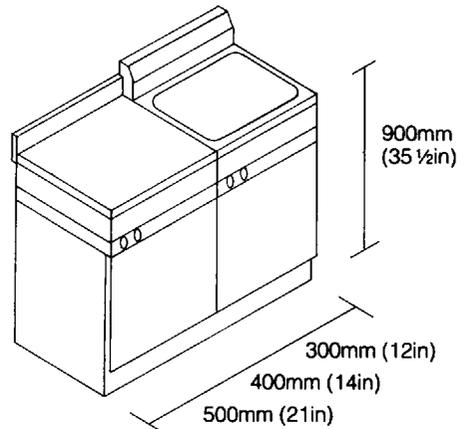
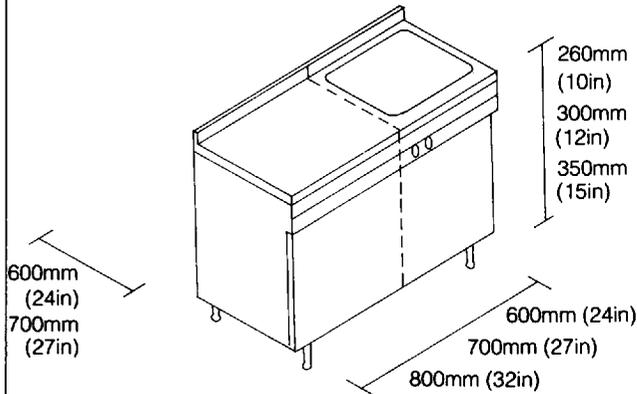
**Cooking equipment
External dimensions**

Equipment dimensions vary with the manufacturer. The most common modular sizes are indicated.



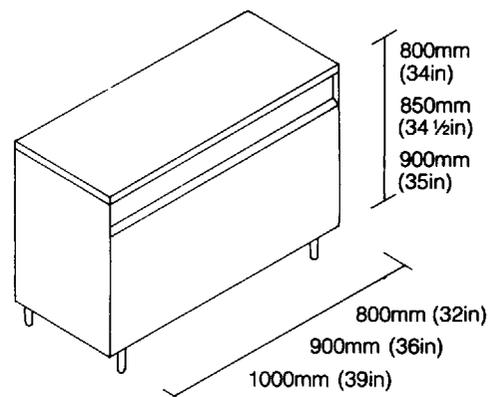
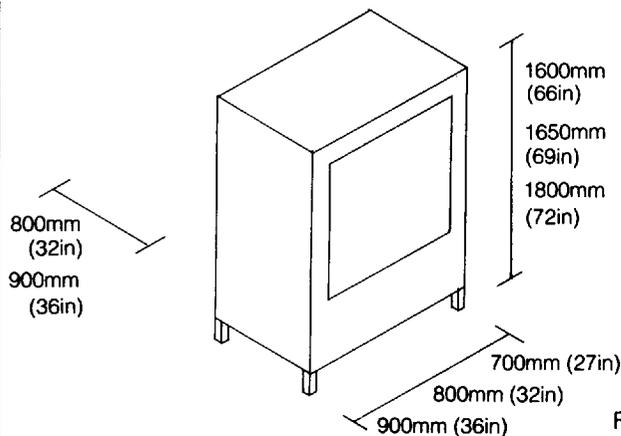
Medium duty equipment

For food production in medium-sized hotels, stores, conventional restaurants, employee feeding services, etc. The equipment is usually general purpose and may be wall or island sited. The height is adjustable for levelling.



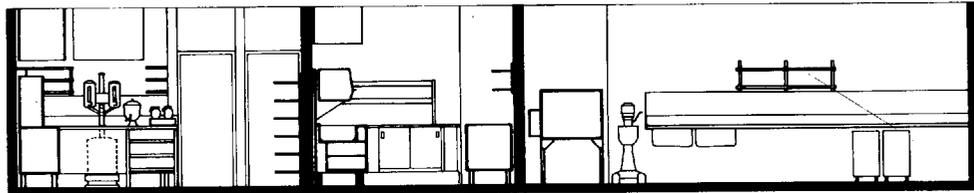
Counter top units for back-bar installation

Examples of combinations

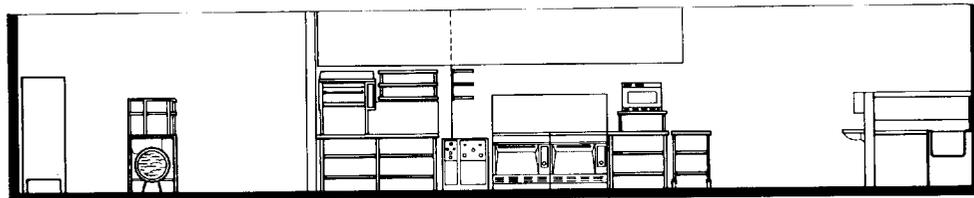


Large scale heavy duty equipment

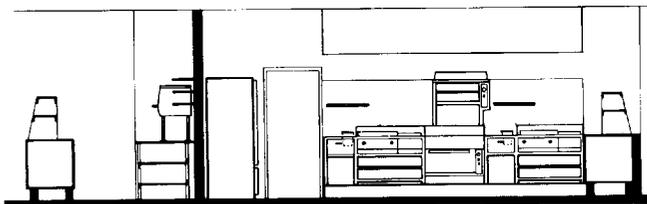
For large scale operations in large hotels, hospitals, employee feeding services and central production units the equipment is usually more specialised. Continuous cooking equipment may be installed.



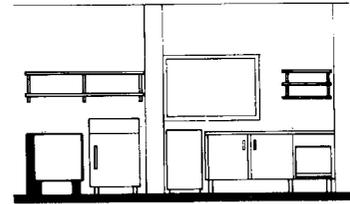
A-A



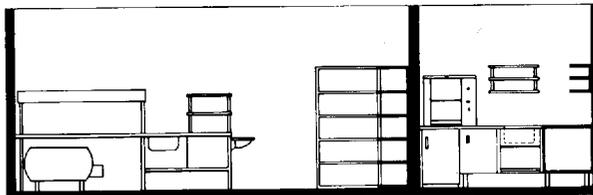
B-B



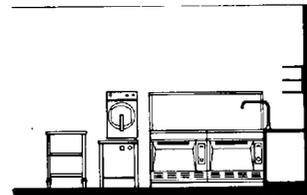
C-C



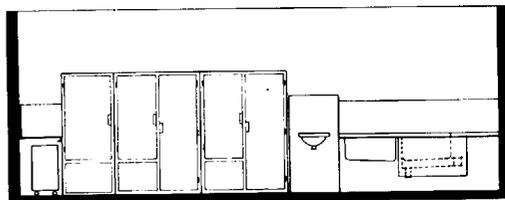
D-D



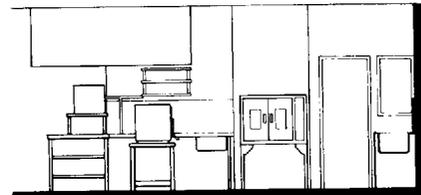
E-E



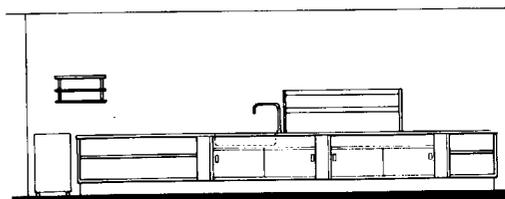
F-F



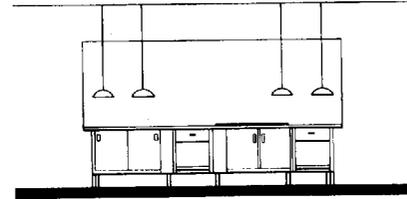
G-G



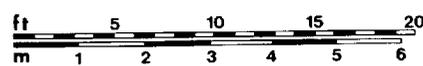
H-H

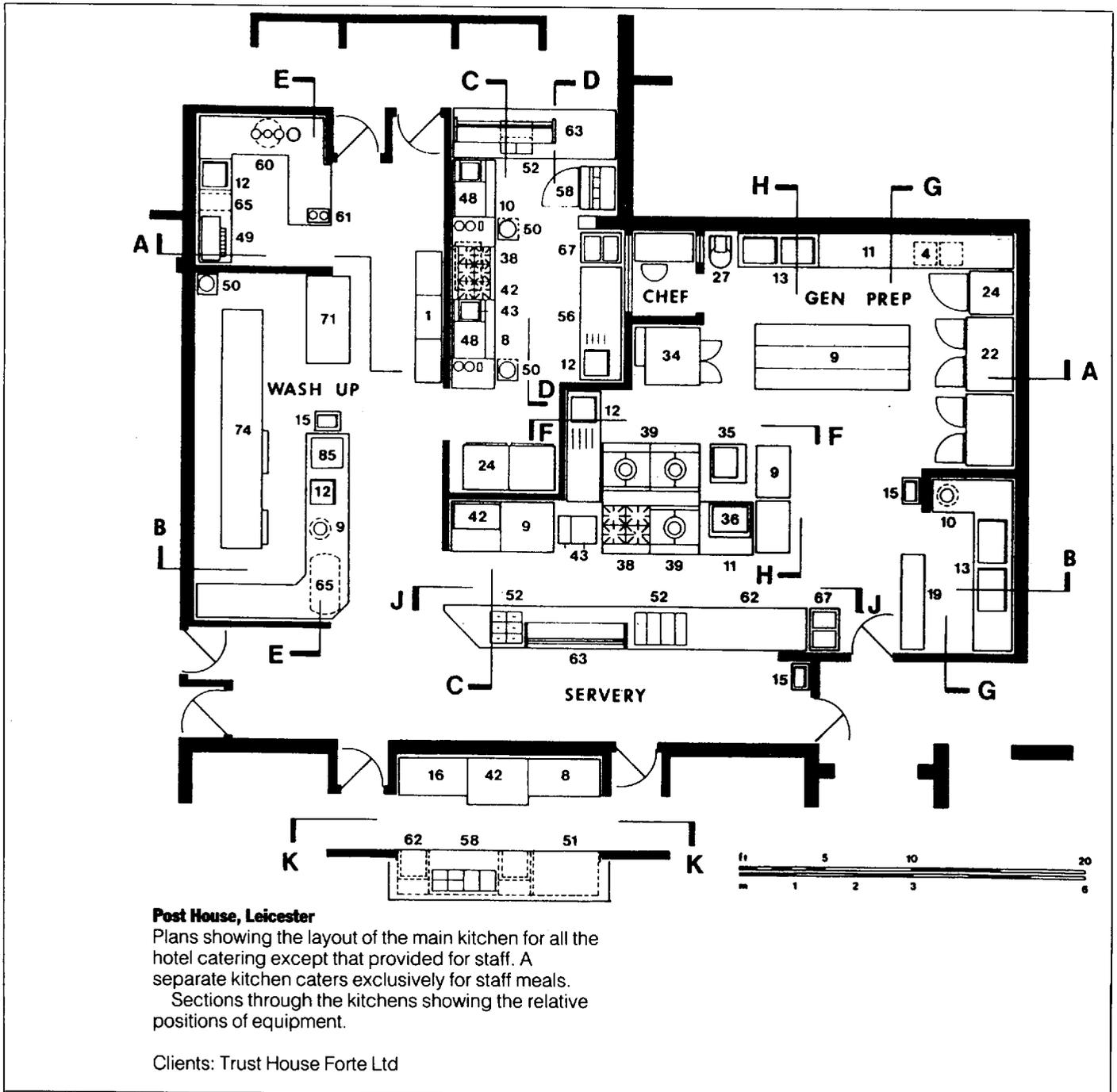


J-J



K-K





preferred in most cases because of the

- economy in floor space which can be achieved and to facilitate convenient arrangement of work centres around the equipment,
- access for cleaning and maintenance which is generally more easily provided when equipment is grouped away from the walls,
- benefit for employees using perimeter work benches provided with natural light and ventilation and, possibly, a view through a window to improve their working environment.

Engineering services

With island siting of equipment, mechanical ventilation is essential and must include some form of canopy, directional extract grille or channelled ceiling with ducting to confine and remove the steam and fumes. Canopies, ducts, filters, etc, add considerably to costs and tend to be obstructive to light and view, in addition to creating extra cleaning difficulties.
 Electrical, gas and water services (in under floor

or ceiling ducting) and waste pipes or channels are also extended.

Central island grouping of cooking appliances is generally practical

- where the least dimension of the kitchen is about 6.0 m (21 ft),
- for outputs of 150 or more main meals at a time,
- for continuous cooking equipment and 'flight' type dishwashers requiring access to both sides.

The arrangement of the equipment must take account of passage of food through the kitchen:

- boiling and steaming equipment should be sited near vegetable preparation areas, ovens and ranges near pastry and meat preparation,
- because of their repeated use during the meal period, bains-maries, deep fat fryers, grills and salamanders are best placed at the end of the line near the servery,
- for an extensive short order service this equipment may be grouped to form a separate section in or adjacent to the servery.

Dual island grouping

If the width of the kitchen is 9.5 m (31½ ft) or more and the output in excess of 500 main meals per day, travel distances and congestion of movement around the island site can be reduced by the separation of 'wet' equipment, mainly used for cooking vegetables, from the 'dry' or general equipment section.

3.10 Aisle spaces between equipment

Working space must be provided for people working at equipment and benches while allowing sufficient room for others to pass by. For this, and for people working back to back on opposite benches, a width of 1,050 mm (42 in.) is regarded as the minimum.

Mobile equipment

Extra wide aisles – 1,400–1,500 mm (54–60 in.) – are required where mobile equipment or trolleys are used and additional space needs to be set aside for unused trolleys.

Cooking equipment

Particular care must be taken to avoid congestion around hot equipment to avoid accidents with hot heavy dishes, and to allow for the swing of opening doors. Here, clearances of 1,250–1,350 mm (48–54 in.) are essential.

3.11 Flexibility in planning

The nature of work in large-scale kitchens varies

continually as different food materials are used and successive stages of preparation are reached. To facilitate these changes the equipment used in food preparation should be equally flexible in arrangement – by being movable and mobile:

- tables can be fitted with wheels and locking brakes,
- preparation equipment and machines can be mounted on trolleys or wheel bases,
- mobile racks can be used for containers and utensils.

In addition, the use of mobile equipment permits easier stowing and storage of items not in use, thus saving floor space, facilitating cleaning and preventing unnecessary handling and carrying when food is transferred from one section to another.

Flexibility in layout is not required (other than for cleaning) in small or highly specialised operations where space is confined.

3.12 Method study

There are two main approaches to determining operational standards for commercial food services:

- *work study*: to evaluate the work content of a task (for job specifications, labour and skill assessments, training, determination of labour costs and incentive payments),
- *method study*: to improve the way in which work is done (to develop more convenient or efficient systems, in planning new installations, evaluating benefits from new equipment or methods of working).

Method study (examples considered below) involves a critical examination of the activities, movements and times involved in food service operations to:

- identify deficiencies, delays or frustrations,
- evaluate and compare possible improvements,
- plan new systems on a rational basis.

Method	Applications
<i>Flow processes</i> Step-by-step analysis of flow processes involved in food preparation or labour utilisation	To determine optimum time, critical path and most efficient allocation of resources
<i>Travel, travel relationships</i> Monitoring of movements of labour in carrying out tasks	To minimise effort, plan layouts and avoid delays or congestion
<i>Activities</i> Recording nature and times of the various activities	To determine the optimum utilisation of equipment and labour

Method study may be carried out by:

- observation, time recording and note-taking,
- video recording of movement and activities,
- computer recording of flows, changes, actions.

3.13 Computer-aided design

Much of the repetitive work involved in planning food production and service can be programmed, enabling drawings to be prepared, modified and extended into perspectives by computer draughting.

Computer programming is greatly facilitated by

- standardisation of equipment dimensions,
- rationalisation of the food production operations.

3.14 Food preparation areas

Traditional methods of food preparation are usually divided into four sections, partly because of the nature of the food and type of preparation involved and partly to facilitate the use of specialist equipment and staff.

The size and extent to which these areas are separated depends on:

- food commodities: type of commodities used,
- company policy: amount of preparation on the premises,
- purchasing specifications: supplied fresh, frozen, ready washed, peeled, trimmed or portioned,
- status of establishment: standards, emphasis on fresh food,
- size: output, number of meals supplied,
- location: value of space, areas available.

Methods of preparation may be separated as:

Areas	Typical requirements
Vegetables, salads	Adjacent to or within vegetable stores to confine splashing, dirt, debris. Equipment includes potato peeler, sinks, waste disposal units, chippers, vegetable mills, salad trays. Separation usually warranted for 100+ meals per day
Meat and fish	Near cold stores or with separate refrigerators to confine spillage and avoid cross-contamination. Equipment includes chopping and cutting boards, slabs, mincers, sinks and associated tools. Separation usual for hotels, speciality restaurants, large premises (200+ meals per day)
Bakery and pastry	Near dry stores, with supplementary refrigerators. Specialised area with adjacent pastry ovens. Equip-

General and common areas	ment includes benches, shelving, tray racks, sinks, mixing, rolling, dividing and filling equipment, boiling tops. Separation: in large hotels, specialised bakeries, hospital catering Near cooking equipment and service. May incorporate specialist sections (cold foods). Equipment includes slicers, benches or tables, refrigerators, washbasins, first aid equipment
--------------------------	--

Division of specialist areas may be provided by:

- (a) separate rooms or bays adjoining the main kitchen,
- (b) low walls, about 1.2 m (4 ft) high between areas,
- (c) arrangement of benches and equipment into separate work areas within the main kitchen. The open-plan arrangements in (b) and (c) are usually preferred, to:
 - allow easier communication and supervision,
 - save floor space,
 - enable all cooking equipment to be grouped together.

The use of division walls (a) or (b) depends mainly on size and spatial considerations:

Disadvantages:

- add to construction cost,
- complicate floor drainage,
- involve extra cleaning and maintenance.

Advantages:

- support for shelving tool racks and appliances,
- confine spillage to areas,
- reduce reverberation of noise.

3.15 Environment

Preparation areas generally require:

- *cool conditions*: preferably 16–18°C (60–65°F) for vegetable preparation and pastry work and below 16°C (60°F) for meat and fish,
- *good lighting* without strong shadows or glare to 400 lux (37 lumens/ft²) is essential. Natural light is preferable,
- *ventilation* to give three air changes/hour is usually necessary – increased where heat is produced in the area.

3.16 Areas

Typical areas for fresh meat (jointed), fish and vegetable preparation, assuming commodities are supplied partly pre-prepared:

<i>Number of meals served/day (up to)</i>	<i>Preparation area</i>	
	<i>m²</i>	<i>ft²</i>
100	14	150
200	19	200
400	28	300
600	35	380
800	43	460
1000	48	520

by similar considerations to those outlined in section 3.05. The type of equipment needed for any particular establishment will depend on:

- output of meals, particularly during the main meal period,
- range of menu, number of alternative meals provided,
- level of sophistication in preparation and service.

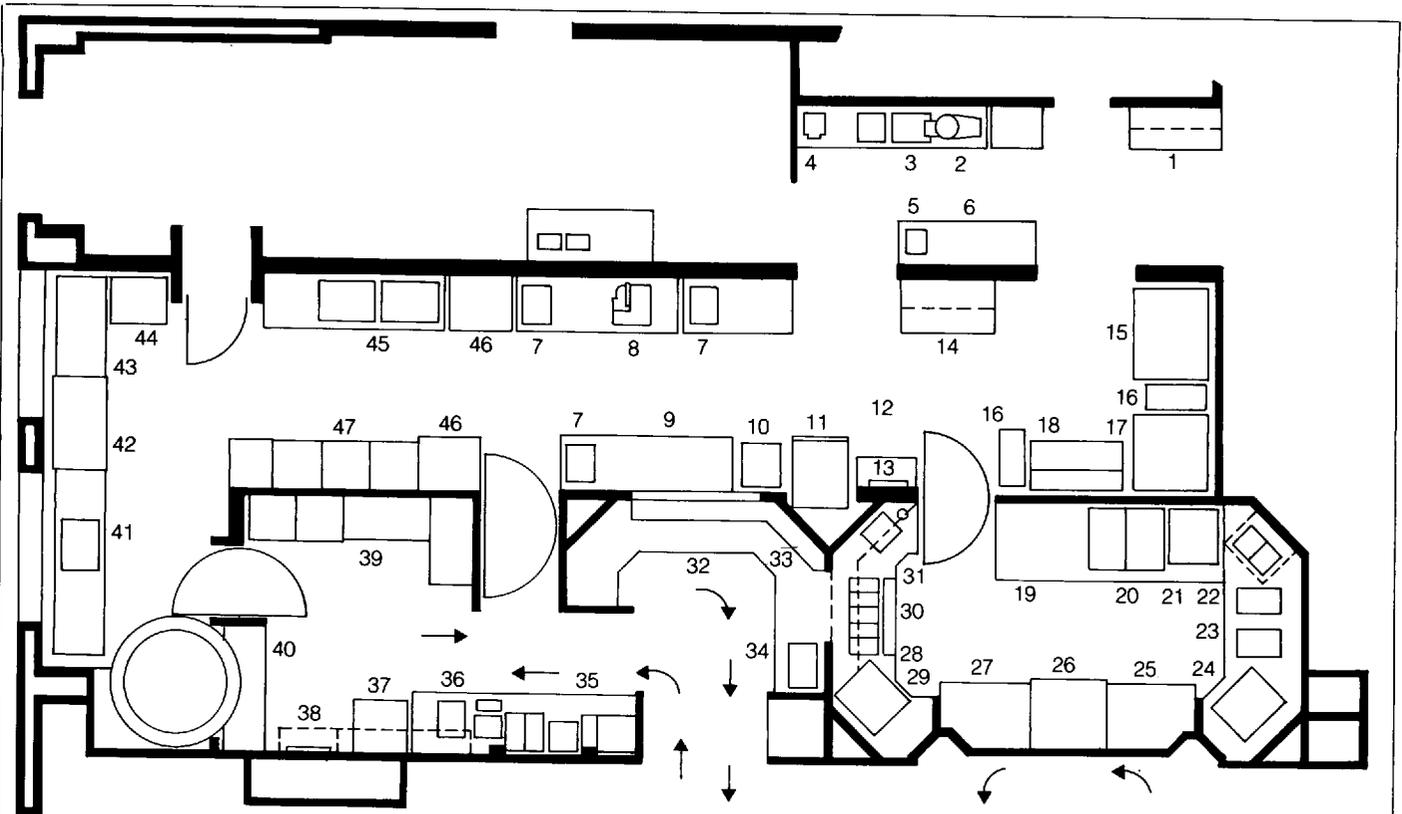
Typical examples are as follows:

4. Food cooking and equipment

4.01 Planning

Requirements for cooking equipment are dictated

<i>Type of establishment</i>	<i>Production requirements</i>	<i>Equipment requirements</i>
High grade hotel, gourmet restaurant	Extensive menu, meals cooked to order	Small capacity, rapid heating equipment. Traditional design
Family restaurant, store restaurant, most hotels	Varied menu, moderate choice, traditional meals	General medium-duty equipment arranged in island (if large) or against walls (if small)
Ethnic or speciality restaurants	Specific menu items, moderate choice	Special requirements, backed by some general equipment which may feature as part of design
Pub restaurants, bistros, wine bars, snack bars	Limited menu – one or two course meals. May be cooked to order	Small back-bar equipment, including microwave ovens, space restricted
Fast-food units	Limited menu, high output, long periods of use, highly systematised	Special equipment designed to operate intensively/continuously. Automatic regulation
Institutions, employee catering facilities	Varied menu, moderate choice, defined meal times often with highly concentrated demands. Numbers predictable	Large capacity, high output equipment with fast heat recovery. Separate call order section of equipment may be provided
Banquet hall, convention centre, conference and function facilities	Predetermined menu, limited choice, precise meal times, with quick service. Advanced booking	Large capacity equipment for storage and end-cooking of all meals prior to service. Highly systematised production



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 Ultra-violet insect control (on wall)
- 13 Wash-hand basin

Main kitchen – primary cooking area

- 14 Mobile heated trolley
- 15 Mobile 2-tier convection oven

- 16 Boiling unit
- 17 2 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 2 induction heaters over bench with chilled drawers
- 21 Boiling top
- 22 Grill/salamander mounted over tiled worktop with inset heated pans
- 23 2 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 2 toasters
- 34 Large toaster over refrigerator
- 35 Beverage stand fitted with glass/cup racks and housing fruit juice dispense, shake mixer, milk dispense 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

Service circulation

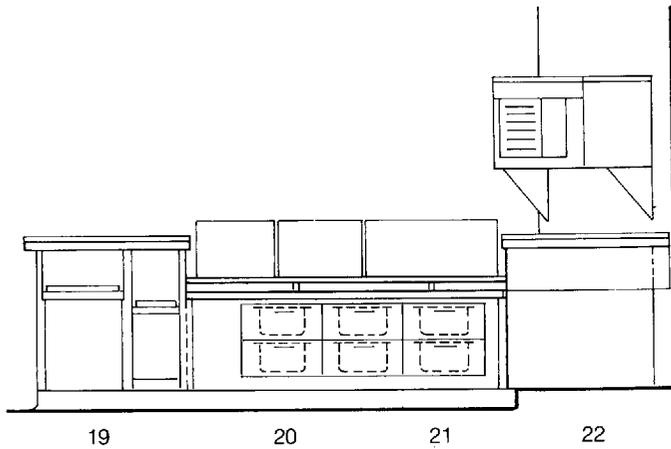
Post House Hotel, Severnoaks

The plans of one of the latest Post House hotels illustrated the considerable advances made in food services equipment and planning in the 1980s. The facilities include separate main and display kitchens.

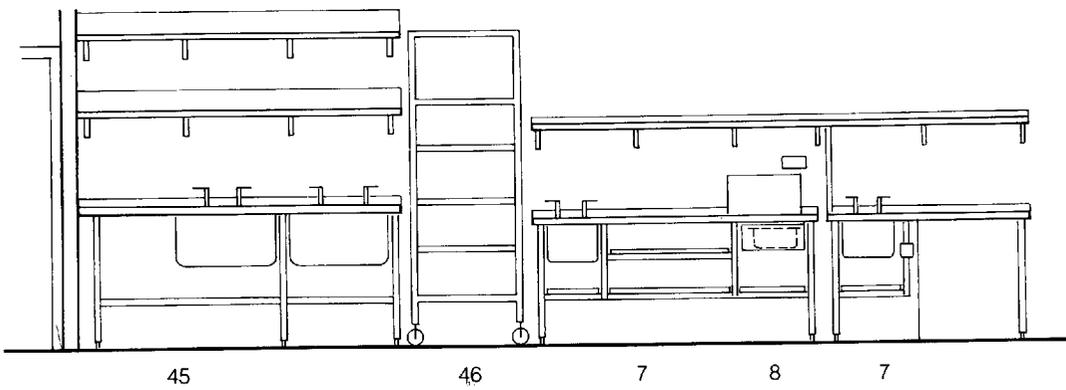
Trust House Forte, by far the largest hotel group in Great Britain, have also been a leading innovator in developing efficient systems of food production consistent with high quality.

Development: Trust House Forte Ltd
Plans prepared by Stangard Ltd

→ service circulation

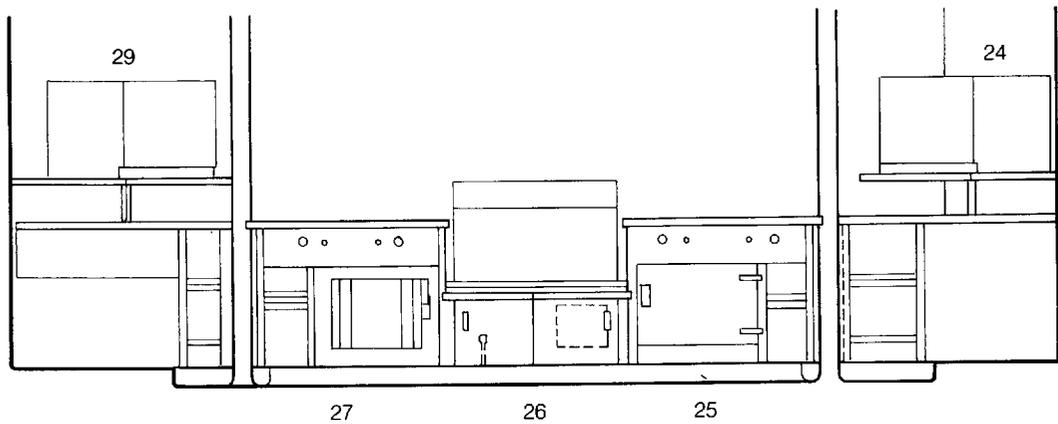


Elevation: display kitchen - finishing area and servery

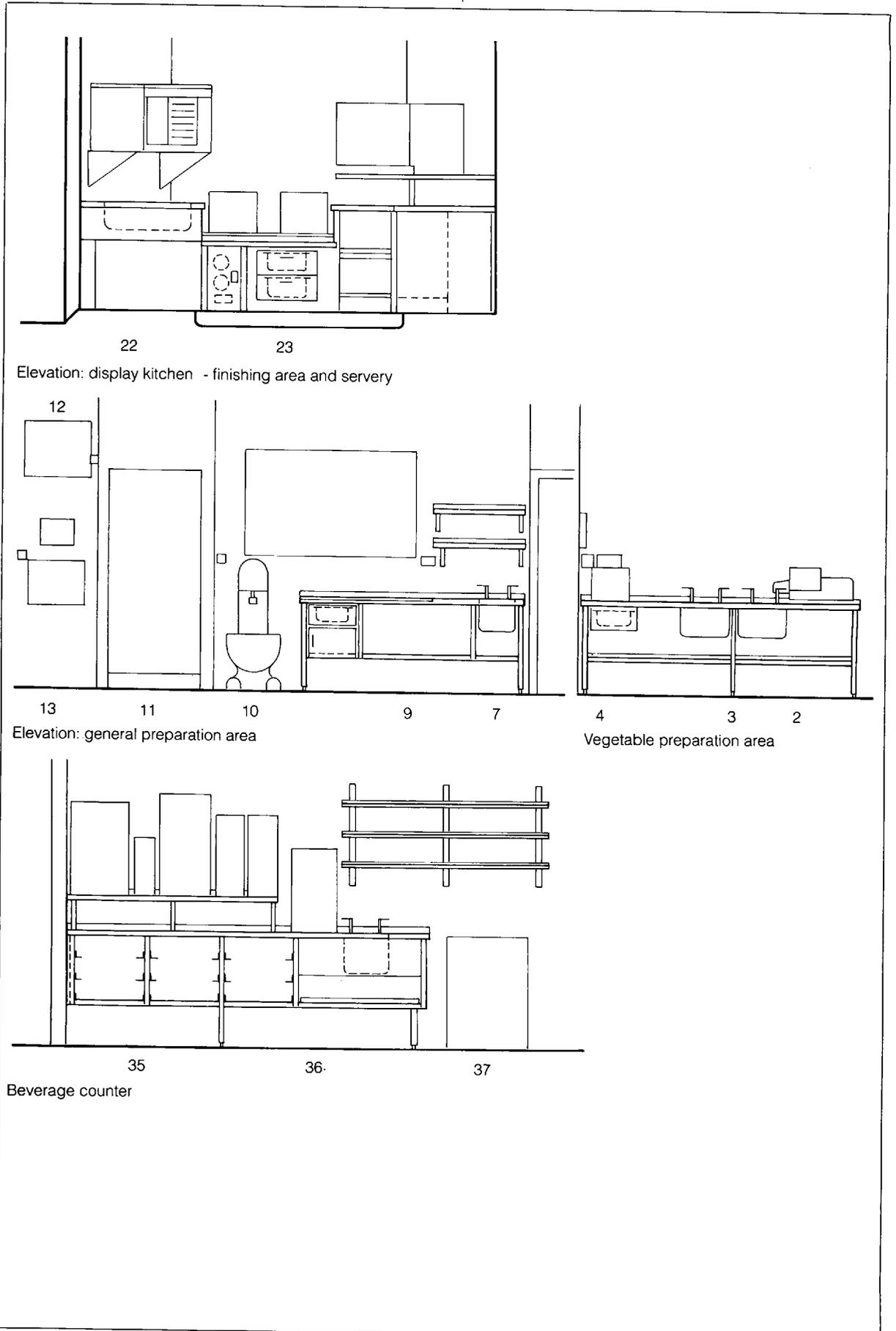


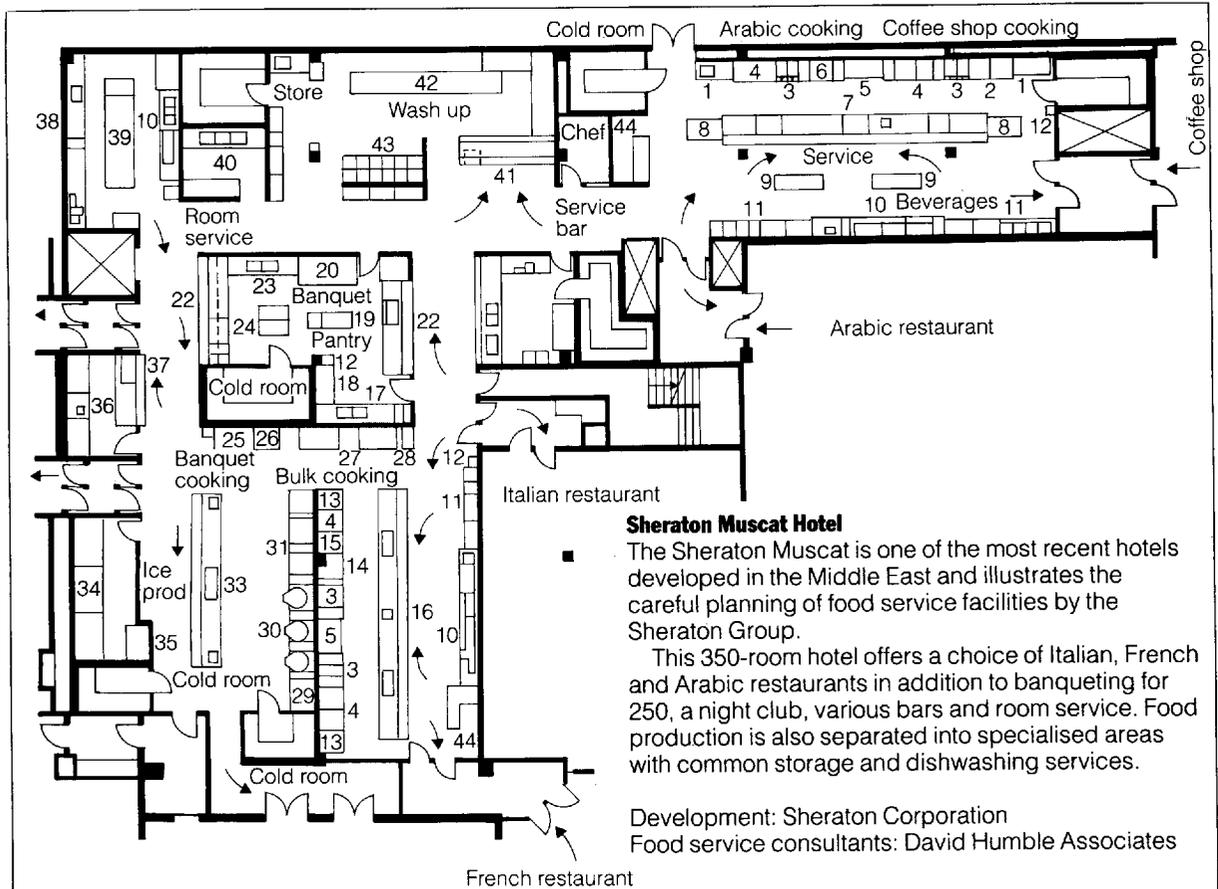
Pot wash

Preparation area



Display kitchen - finishing area





Sheraton Muscat Hotel
 The Sheraton Muscat is one of the most recent hotels developed in the Middle East and illustrates the careful planning of food service facilities by the Sheraton Group.
 This 350-room hotel offers a choice of Italian, French and Arabic restaurants in addition to banqueting for 250, a night club, various bars and room service. Food production is also separated into specialised areas with common storage and dishwashing services.

Development: Sheraton Corporation
 Food service consultants: David Humble Associates

- | | | | | | |
|---|---|---|--|---|--|
| <p>Service circulation</p> <p>Coffee shop cooking area</p> <p>1 Sink with wall shelf</p> <p>2 2 no. griddles</p> <p>3 2 no. fryers with adjacent worktop</p> <p>4 2 no. hot top ranges with overshelves</p> <p>5 Refrigerator</p> <p>Arabic cooking area</p> <p>6 Charcoal broiler</p> <p>3 2 no. fryers</p> <p>4 2 no. hot top ranges with overshelves</p> <p>5 Range mounted broiler</p> <p>1 Sink with wall shelf</p> <p>Pick-up area</p> <p>7 Hot and cold distribution counter with over shelf and tray slide</p> | <p>8 Pass-through refrigerators</p> <p>9 Hot cupboards</p> <p>Self-service station</p> <p>10 Beverage and breakfast counter with automatic boiler, conveyor toaster, fruit juice and chocolate dispensers, espresso and coffee machines</p> <p>11 Service racks and basket racks</p> <p>12 Wash-hand basin</p> <p>French cooking section</p> <p>13 Radiant broiler</p> <p>4 2 no. hot top ranges with overshelves</p> <p>3 2 no. fryers with adjacent worktop</p> <p>5 Refrigerator</p> | <p>Italian cooking section</p> <p>3 2 no. fryers with adjacent worktop</p> <p>14 Pasta cooker</p> <p>15 Griddle</p> <p>4 Hot top range</p> <p>13 Radiant broiler</p> <p>16 Hot food counter with overshelf and tray slide</p> <p>Pantry area</p> <p>17 Workbench with double sink and wall shelf. Conveyor toaster</p> <p>18 Work table with overshelf</p> <p>12 Wash-hand basin</p> <p>18 Trolley racks for gastronorm containers</p> <p>19 Worktable with refrigerator cupboard and slicing machine</p> | <p>20 Combined mixer</p> <p>21 Ice cream conservator</p> <p>22 Cold food counter with overshelf and tray slide</p> <p>Banquet cold preparation section</p> <p>23 Workbench with double sink and wall shelf</p> <p>24 2 no. worktables</p> <p>22 Cold food counter with overshelf and tray slide</p> <p>Bulk cooking section</p> <p>25 Roasting oven</p> <p>26 Pressure/pressureless steamer</p> <p>27 2 no. convection ovens</p> <p>28 Pasta machine</p> | <p>Banquet cooking section</p> <p>29 Worktable with weighing scales</p> <p>30 3 no. tilting kettles</p> <p>31 2 no. bratt pans</p> <p>4 Hot top range with overshelf</p> <p>32 2 no. worktables</p> <p>33 Hot food counter</p> <p>Ice production room</p> <p>34 3 no. ice making machines</p> <p>35 Ice flaker</p> <p>Banquet beverage service</p> <p>36 2 no. cabinet refrigerators with adjacent sink and workbench</p> <p>37 Beverage service counter</p> | <p>Room service section</p> <p>38 Sink and workbench with egg boiler and toaster</p> <p>10 Beverage counter</p> <p>39 Trolley park</p> <p>Wash-up area</p> <p>40 Pot wash area with triple sink and racking</p> <p>41 Stripping shelves and rack slide with underbench waste containers</p> <p>42 Flight dishwasher</p> <p>43 Trolley park</p> <p>44 Cashier desks</p> |
|---|---|---|--|---|--|

4.02 Cooking equipment

Energy transfer to food can involve a variety of processes (baking, boiling, frying, grilling, etc). Traditional cooking equipment consists of ovens, boiling tables (hobs), fryers and grillers (broilers) with more specialised items for large output. The trend in equipment design is to speed up the cooking cycle by increasing the rate and effi-

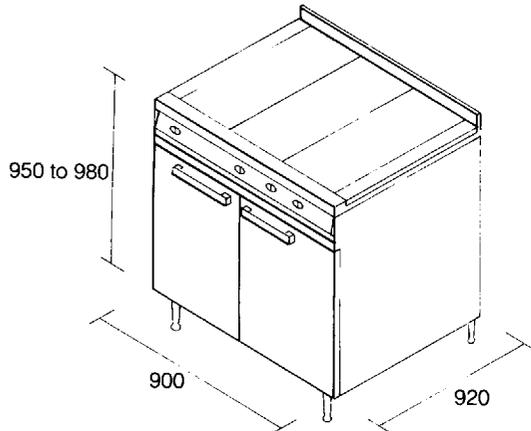
ciency of heat transfer and combining processes. In small-scale operations it is necessary to rationalise the work to minimise equipment costs and space.

The following examples are intended only as a guide. Performance ratings, dimensions and specifications will depend on individual manufacturers' equipment.

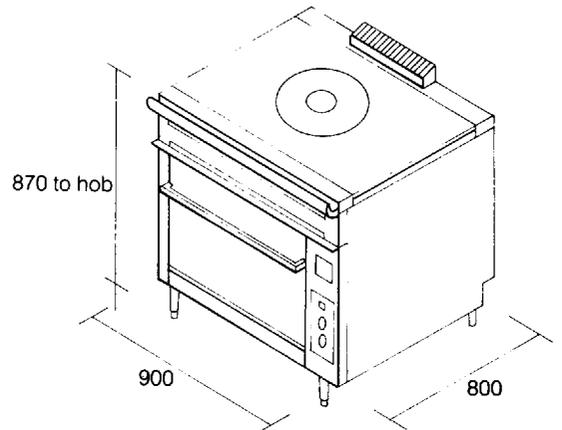
Type	Main features	Typical size and rating		
Ovens	Transfer heat to food within an enclosure. May use hot air (circulated by natural or fan assisted convection), infra-red or microwave emission	(s) – small units (m) – medium duty (h) – heavy duty		
General-purpose oven	Using hot air for baking, roasting 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. 0.015 m 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) (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 1.5–5.0 μm. 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

Type	Main features	Typical size and rating		
Halogen elements	Alternative to gas burners and electric radiant rings. Used in hobs to provide instantly adjustable heat output			
Induction heaters	Electro-magnetic alternating currents of 25 kHz directed through ceramic hob. Used to induce eddy currents in steel pans producing indirect heating for boiling or frying	(s)	1 ring	3.6 kW
		(m)	2 ring	7 kW
		(h)	4 ring	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)	45l.	7 kW
		(m)	90l.	11.5 kW
		(h)	135l.	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)	0.28 m ²	6.4 kW
		(h)	0.44 m ²	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)	5l.	3 kW
		(m)	7l.	5.8 kW
		(m)	16l.	10 kW
		(h)	20l.	20 kW
Pressure fat fryers	Fryer fitted with sealed lid. Operated at 62 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)	0.17 m ²	4 kW
		(m)	0.4 m ²	7.5 kW
Grilling	Food exposed to elements emitting high intensity radiation in wave band 0.7–2.2 μm	(s)	0.1 m ²	3 kW
		(m)	0.25 m ²	5.7 kW
		(h)	0.27 m ²	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)	28l./h	2.8 kW
		(m)	48l./h	5.3 kW
		(h)	68l./h	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 (standard-sized sizes). May be dry or water filled. Thermostatically controlled at about 74°C (165°F)	(s)	2 units	0.5 kW
		(m)	4/6 units	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 (4 ft) counter unit holds about 300 plates	(m)	1.2 m wide	3 kW
		(m)	1.8 m wide	4.5 kW

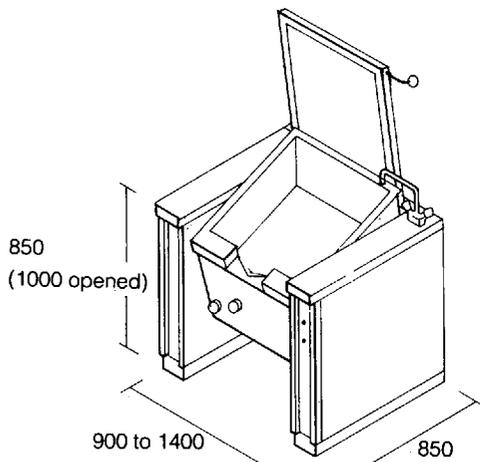
Cooking equipment: examples of dimensions



Oven range
200 litre (7 cu. ft.) heavy duty range
18.0 kw rating (electric)
Hob with 3 solid hotplates
(Alternative: griddle plate)

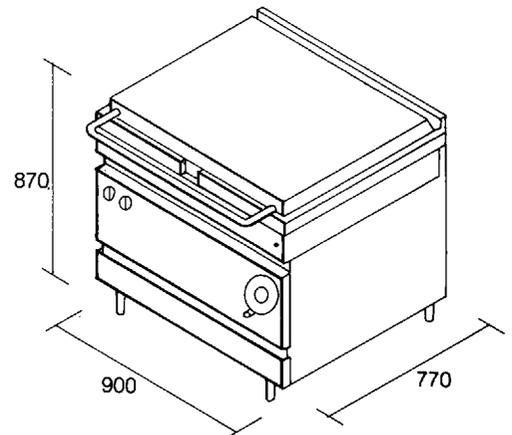


Oven range
150 litre (5.4 cu. ft.) heavy duty oven range
with drop down door
16.5 kw rating
Solid hob top with tapered heat

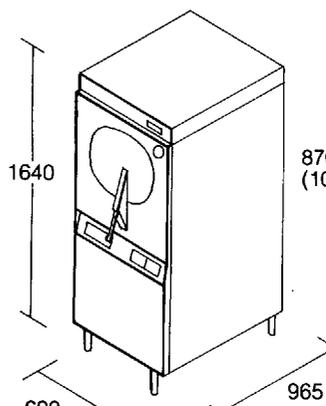


Bratt or braising pan with pillar support

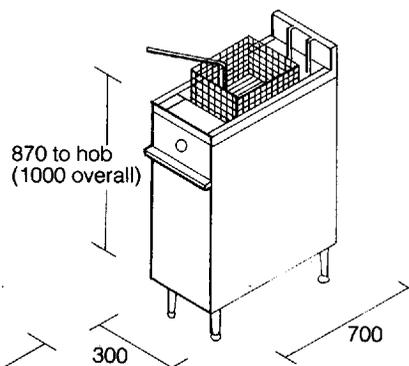
Capacity litre	width mm	rating kw
40	900	6.4
80	1200	11.8
100	1400	14.8



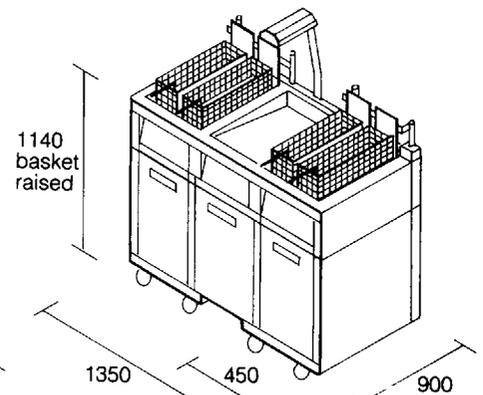
Tilting bratt pan with operating wheel and trunnion



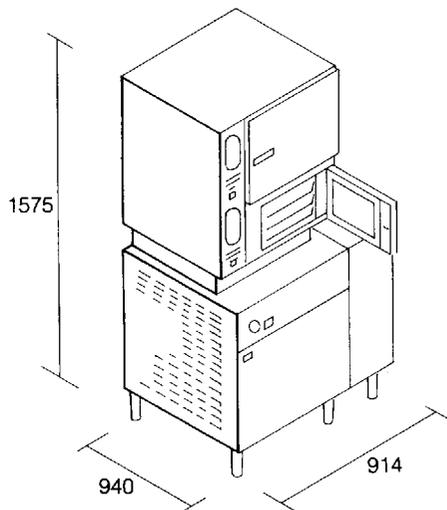
high pressure steamer
on stand 12 kw rating



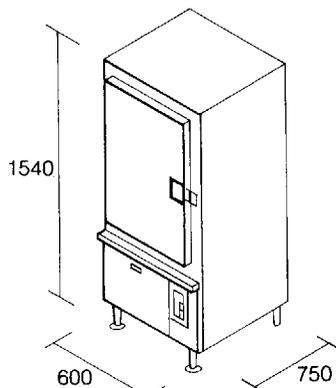
deep fryer with one basket
16 litres oil capacity: 9 kw
output 22.7 kg chips per hour



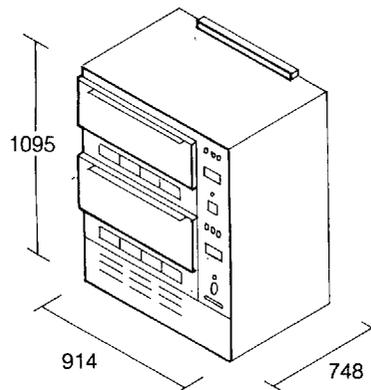
combination fast food fryer
with dual deep fryers and central
chip dump. Each fryer 21.5 kw
Automatic basket lifting
Integral oil filtration



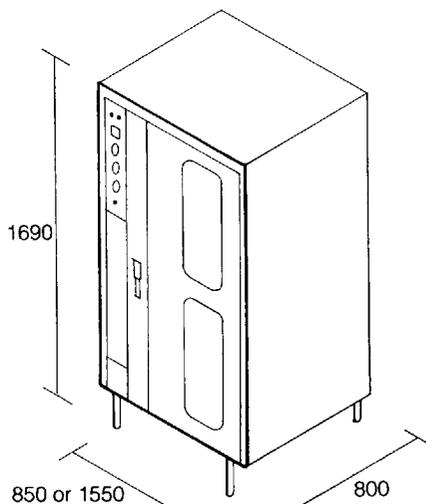
Convection steamer
(2 compartments)



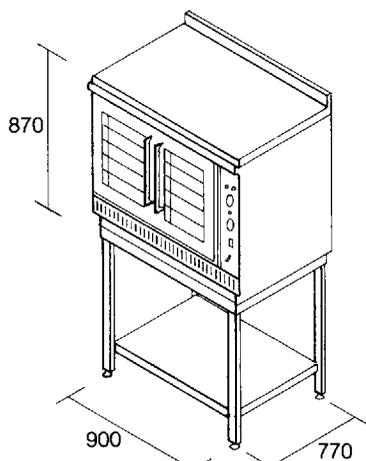
Atmospheric steaming oven
with steam generator in base



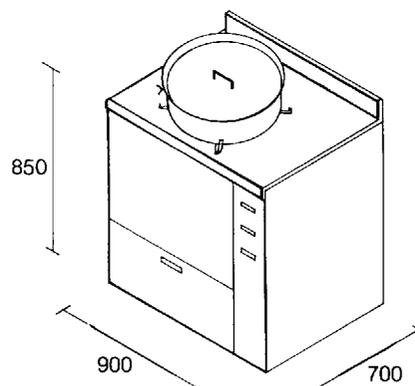
Tiered convection oven
Each 65 litre (2.3 cu. ft.) 8.8 kw



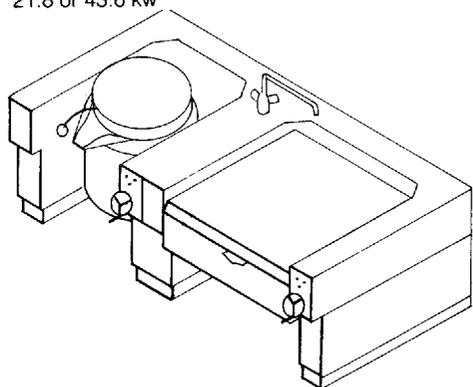
Autoreverse convection oven
21.8 or 43.6 kw



Forced convection oven on stand
145 litre (5 cu. ft.) 9.2 kw

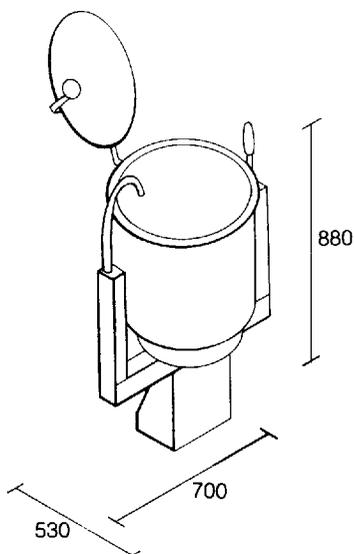


dual purpose boiling pan
90 litre
Direct fired or steam jacketed

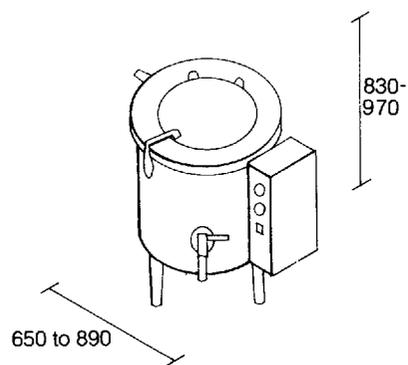


tilting kettle & braising pan console

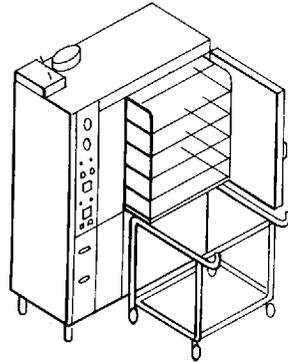
unit width	Kettle capacity (litre)	Kettle rating (kw)	Bratt pan capacity (litre)	Bratt pan rating (kw)
1200	70	15	68	9
1400	200	27	89	12



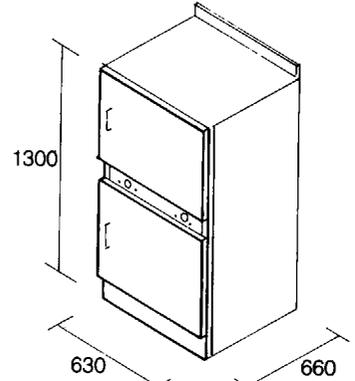
Tilting kettle with swivel cold water feed. 40 litre capacity electric or steam heated



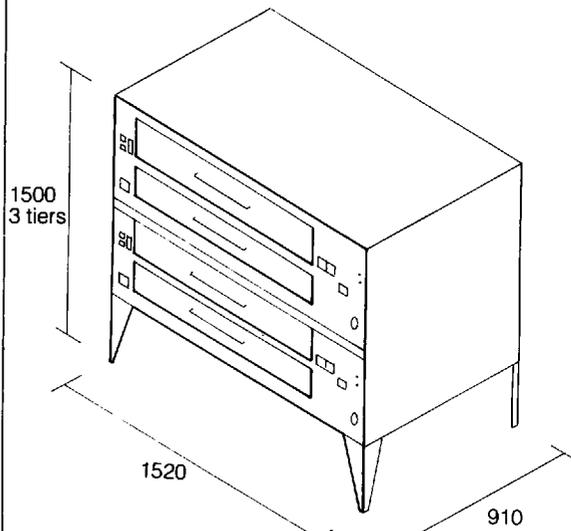
Vacuumic boiling pan
with electric or steam heated jacket
45, 90 or 135 litre



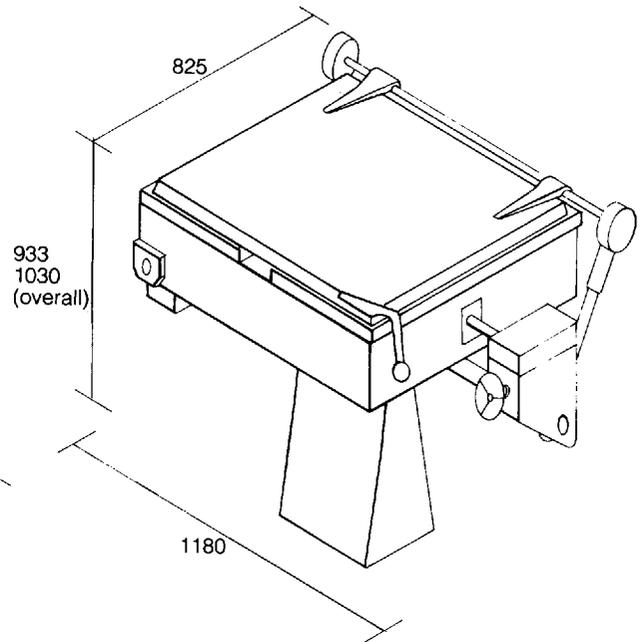
bulk loading system
with mobile transporter



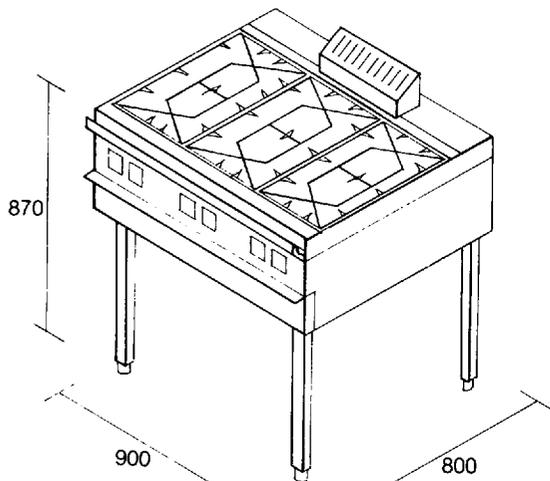
2-tier general purpose oven
each 80 litre (3 cu. ft.) capacity



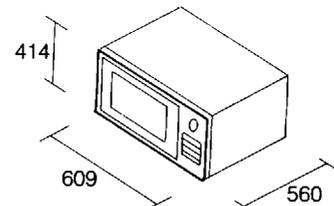
tiered pastry or pizza oven



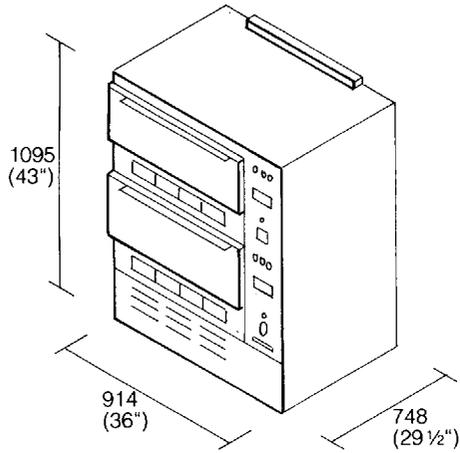
tilting bratt pan



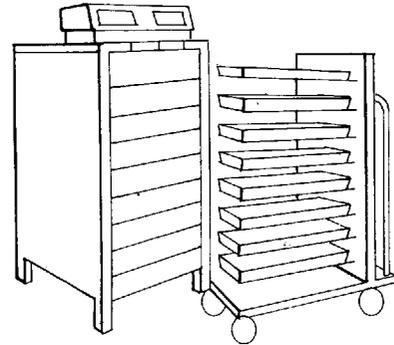
heavy duty boiling table
with open gas burners



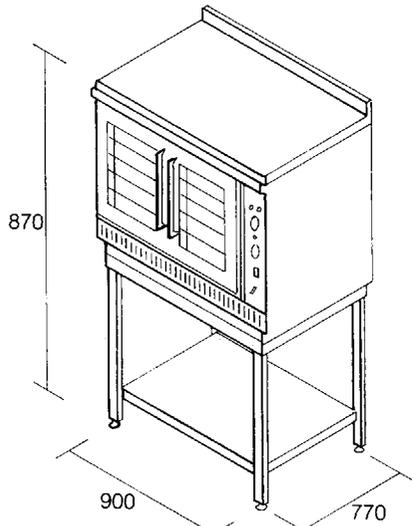
microwave oven
2.6 kw supply
1300 w output



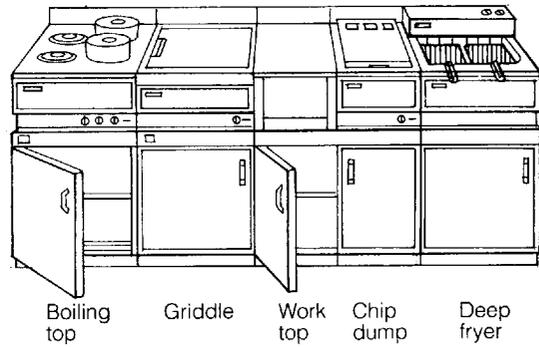
Tiered forced convection oven
Each 65 litre (2.3 cu. ft.) 8.8 kw



Infra-red (reethermic) oven system
4.7 to 5.0 kw

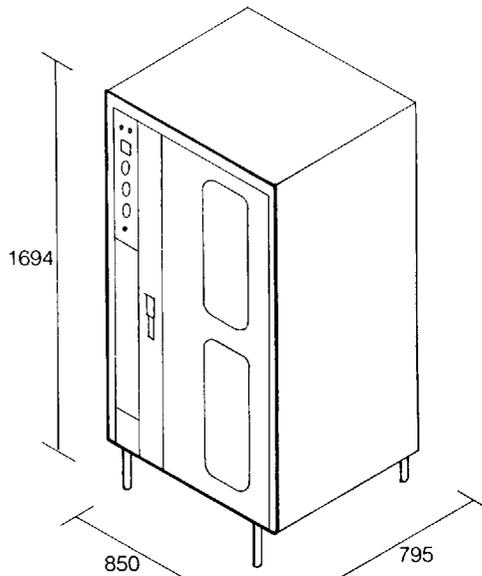


Forced air convection oven on stand
145 litre (5 cu. ft.) 9.2 kw

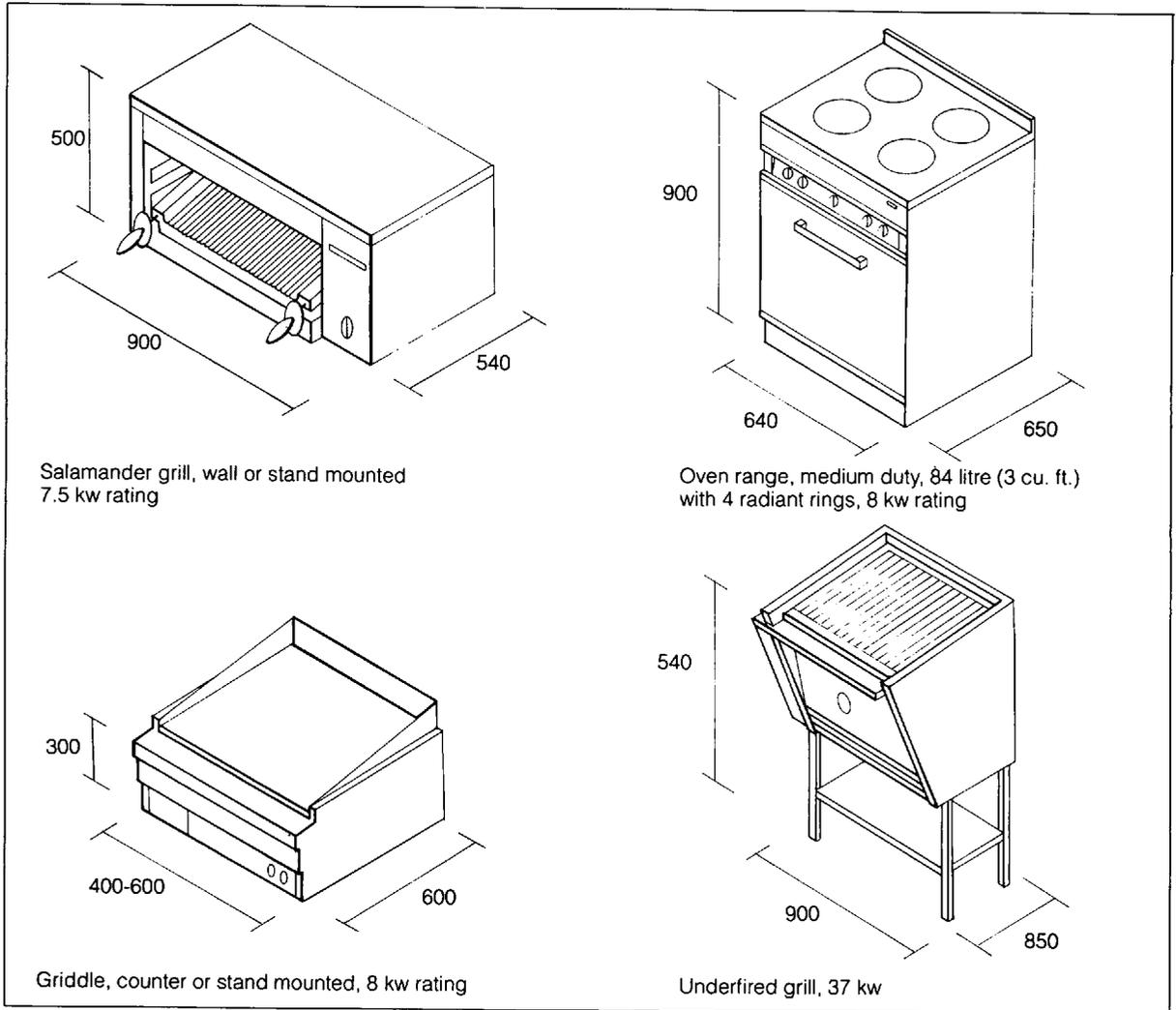


Boiling top Griddle Work top Chip dump Deep fryer

Examples of combined units with undercounter cupboards



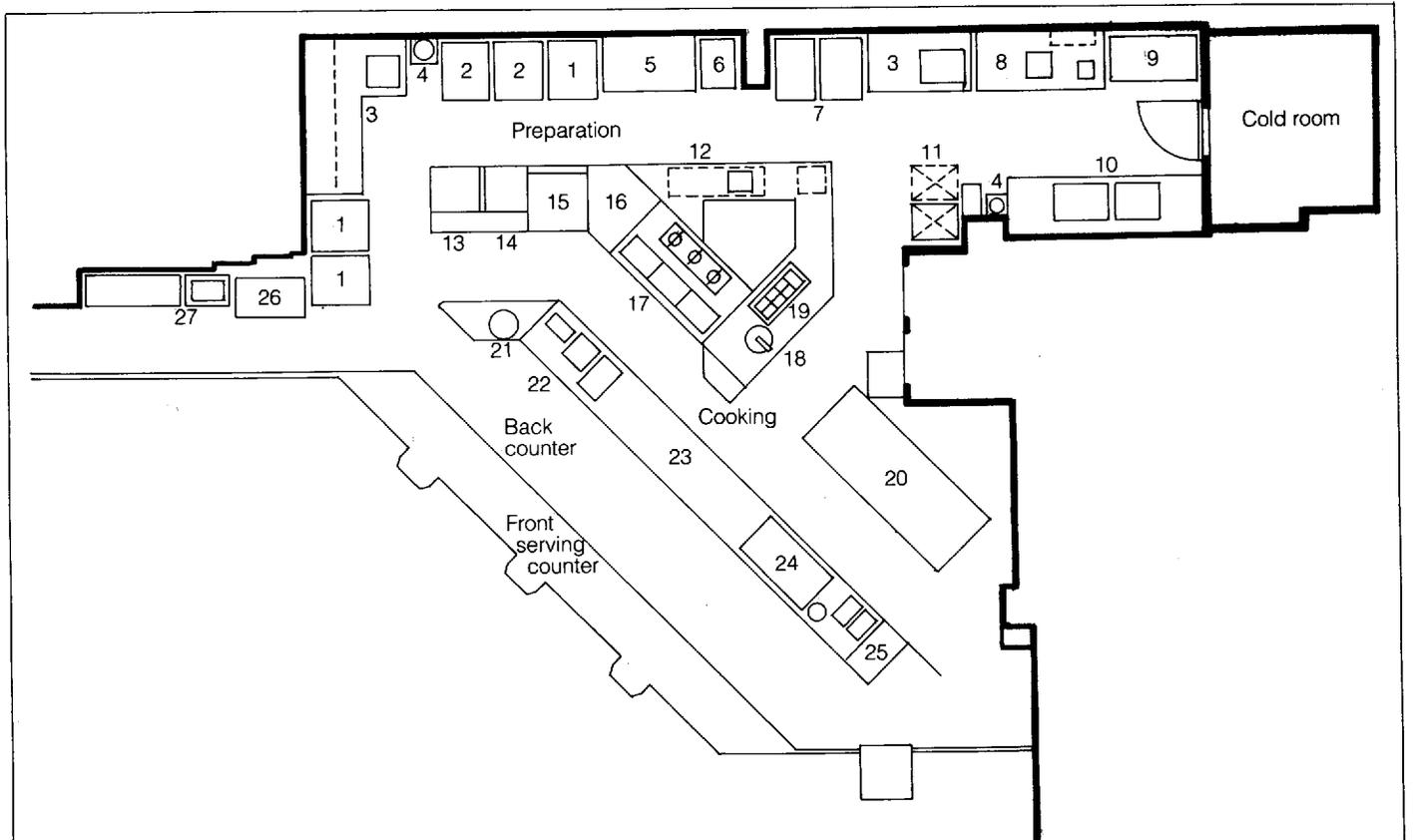
Auto reverse forced convection oven
with steam injection 22 kw



4.03 Combined cooking processes

Cooking equipment may combine more than one process of heating, for example:

<i>Equipment</i>	<i>Applications</i>
<i>Forced air convection ovens</i>	
Steam injection or water evaporation	To reduce moisture loss
hickory smoke	To impart flavours
<i>Microwave ovens</i>	
Forced air convection heating	For roasting and baking
Radiant elements	To sear and flavour
Pulsation of energy	For thawing frozen food
<i>Infra-red heating</i>	
Forced air convection heating	For increased heat transfer
<i>Pressure steaming</i>	
Free vented steam option	For delicate foods



Seasons Pastizzeria, London

An enterprising new development by Trust House Forte which provides a wide range of pasta and pizza dishes freshly prepared on the premises. Most of the equipment was custom designed.

Development: Trust House Forte Ltd
Plans prepared by Stangard Ltd

Preparation area

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

Central cooking area

- 10 5-tier mobile rack
- 11 Double sink
- 12 Trolley park
- 13 Pizza preparation bench with roller and tray racks
- 14 Microwave convection oven
- 15 Steamer
- 16 Pasta cooker
- 17 Drainer
- 18 Heated bain-marie with infra-red 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 drinks dispense 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

4.04 Standardisation

Most manufacturers produce equipment to the dimensions of their own modules for easy combination of suites. The joints can be covered and casing provided to conceal engineering services. External dimensions are generally not standardised although working heights are normally 865–900 mm (2 ft 10 in.–3 ft). The trend is towards modular configurations, namely:

Typical external dimensions	Width		Depth	
	mm	in.	mm	in.
Small back-bar equipment	500	20	400–500	16–20
Medium-duty, floor-standing equipment	750–900	30–36	600–750	24–30
Heavy-duty floor-standing equipment	900–1050	36–42	750–900	30–36

In Europe internal container sizes are largely standardised on the gastronorm dimensions

Module size	Dimensions mm
2/1 } see page 191	650×530 (i.e. 2×325)
1/1 }	

4.05 Automated control

Automated control of cooking processes is increasingly necessary because of:

- shortages and high costs of skilled labour,
- need for versatility in staff and work allocation,
- demands for high-speed output of cooking and heat regenerating equipment,
- need for more precise quality control and uniform standards of performance (including energy conservation).

Controls may take several forms, from simple thermostats to fully programmed vending machines. Some of the current developments may be summarised:

Controls	Applications
Solid-state transistors	For precise regulation of temperature, pressure
Pulse controls	For fine adjustment of energy flows
Sensors, transducers	To monitor changes in food temperature, etc
Programmed controls	To operate a series of processes in any set order of time and sequence

Computer-linked controls	To enable a number of units of equipment to be operated from a central processor
Automated equipment	Using controls to activate mechanical operations (in opening doors, measuring, admitting or discharging quantities of food or liquid, etc)

4.06 Mechanisation

To reduce labour, effort and unnecessary movement of employees and materials within a work area, the equipment itself may be mechanised. Mechanisation is only practicable where operations or movements can be standardised. Examples include:

Type of mechanisation	Applications
Conveyor belt transfer of plates and containers along lines between food service stations	For plating meals in hospitals, boxing meals for transport catering, packing meals for chilling or freezing
Conveyor transfer of used dishes	To remote dishwashing areas
Food transporters, elevators	To convey food to other floors
Continuous cooking equipment, with mechanical transfer of food through the cooking medium	For large scale employee and institutional catering where the menu and output can be highly organised. For high output fast-food units using specific products
Conveyor based dishwashing equipment with continuous or automatic transfer of dishes through a series of washing and rinsing stage	For large scale operations. Smaller units provide a cycle of operations (see section 5.01)

4.07 Mobility of equipment

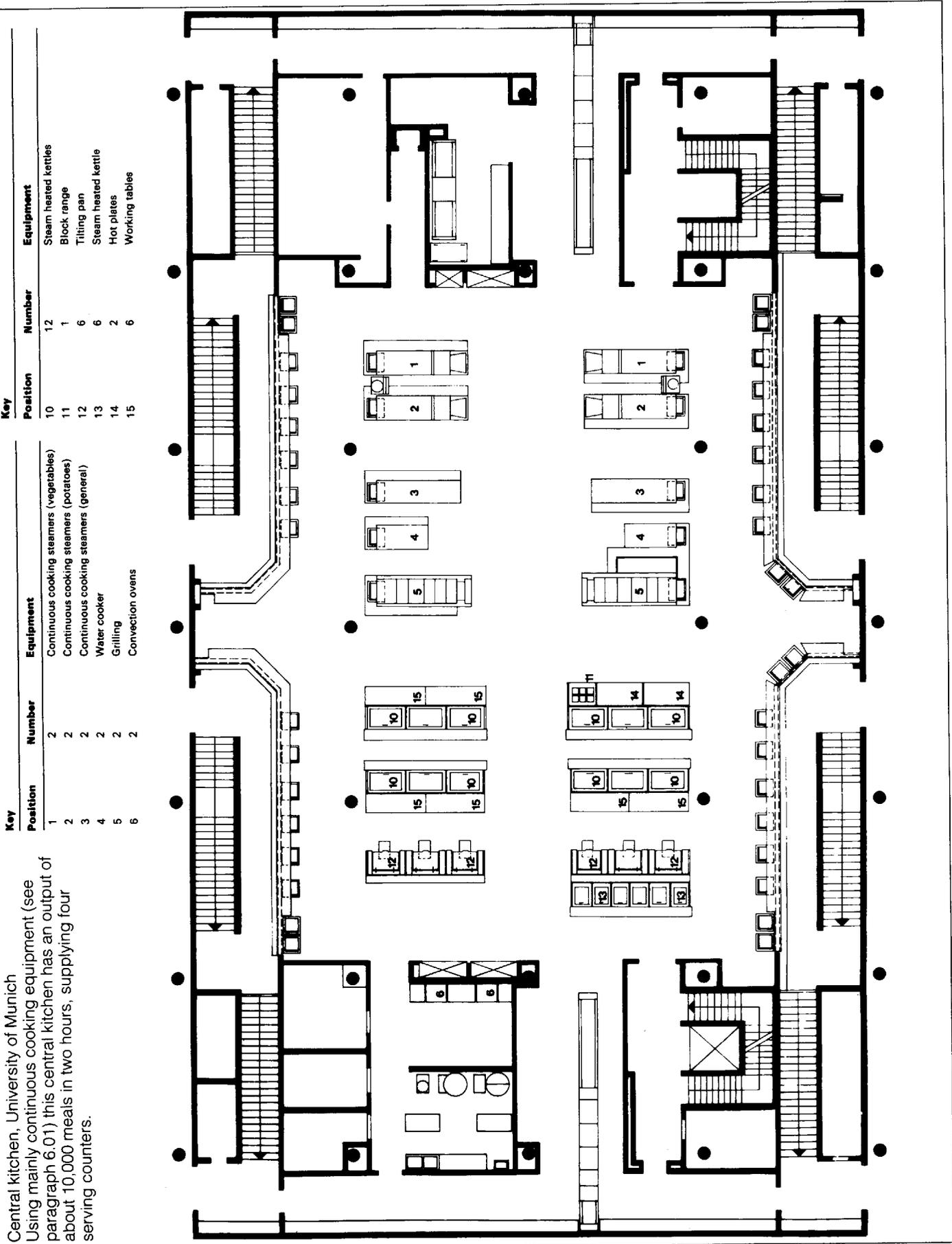
To facilitate re-arrangement of the food production or service areas some of the equipment may be made mobile. Particular examples include:

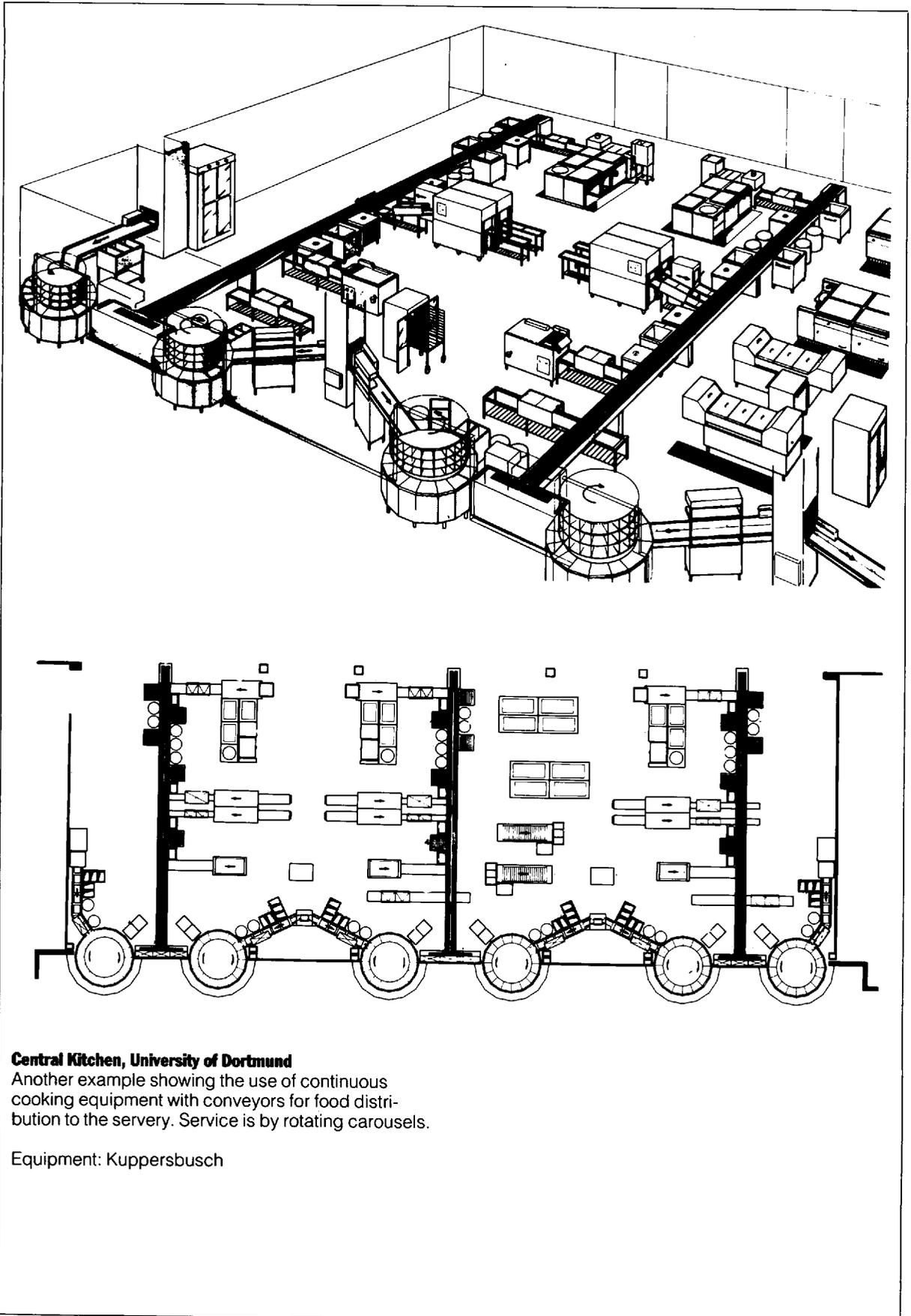
- grouping of work benches and equipment to form convenient 'work stations' within easy reach of employees,
- re-arrangement of serveries to suit peak demands, or for summer salad buffets or snack meal service,
- use of food transporters, carts, trolleys, pre-loading racks and other mobile equipment.

The use of wheels or castors for greater mobility introduces some difficulties which must be taken into account when drawing up plans and specifications:

- *stability*: the equipment framework may need to be strengthened,

Central kitchen, University of Munich
 Using mainly continuous cooking equipment (see paragraph 6.01) this central kitchen has an output of about 10,000 meals in two hours, supplying four serving counters.





Central Kitchen, University of Dortmund

Another example showing the use of continuous cooking equipment with conveyors for food distribution to the servery. Service is by rotating carousels.

Equipment: Koppersbusch

- *height*: addition of wheels may increase working height unless modified,
- *safety*: the wheels must be easily lockable to prevent movement of equipment at the wrong moment,
- *utilities*: terminal points for water supplies, drainage channels and gulleys, and electricity and gas outlets must be predetermined. Flexible connections must provide automatic cut-off or safe isolation for breakages (utility company regulations apply),
- *parking space*: spaces must be allowed for parking or stowage when not in use,
- *washing*: provision must be made for washing food-containing equipment.

4.08 Equipment maintenance

Subject	Developments
Equipment design	Simple casings with continuous surfaces; matching modular units assembled with joint sealing strips
Access	Movable equipment; detachable linings and components, of a size to allow sink washing
Self-cleaning	Treated linings, with high temperature combustion of deposits
Replacement	Planned replacement after five or seven years, to allow updating
Food conveyors	Self-cleaning: passing through washing cycle on return. Trolley and container washing equipment
Pressure jet or steam cleaning (portable or built in)	For large kitchens: planning requirements include: waterproofed electrical systems in structure and equipment. Self-draining, impervious surfaces, which should not contain ducts or cavities that may remain flooded. Movable equipment – to allow daily cleaning. Surfaces to be able to withstand pressures of up to 34.5–69.0 bar (500–1,000 lb/in. ²)
Contract cleaning	Increasingly used for nightly, weekly and periodic cleaning of premises and equipment on planned maintenance basis
Ventilation	Substitution of localised canopies by directional control of airflow to ceiling or wall extracts. Access to grease filters, etc, in large kitchens may be from service galleries
Services	Designed on grid system, housing all services in common sub-floor duct accessible for cleaning and repair. The grid allows easy re-location of equipment

5. Dishwashing

5.01 Panwashing

Facilities for washing pans must be provided in or adjacent to the kitchen and dishwashing area. In small restaurants the general dishwashing equipment may be adequate, but a deep double sink with drainer and pan stand is usually required.

- The trends are towards:
- standardised gastronorm containers which can be transferred from transport to storage–cooking–serving equipment,
 - disposable foil pack containers.

5.02 Alternatives: use of disposables

The arrangements for dishwashing affect the planning of the whole operation. Dishwashing is expensive in terms of space, equipment, labour and energy costs. If disposable items are used, savings can be made but must be set against:

- image: possible effects on range of market appeal,
- maintenance of standards (litter),
- cost of high-quality substitutes.

Disposable cartons and packaging are often used for merchandising, with suitable quality design and labelling to attract attention. Standards of disposables are improving and are aimed at wider use; for example:

- glazed card (to resemble ceramic ware),
- laminates combining expanded plastics (insulation) with surface skins (impervious smoothness),
- decorative, sectional boxes (for high quality packed meals).

In a fast-food outlet the high cost of waste and garbage to be removed will usually justify the installation of a compression machine.

5.03 Collection of used dishes

Methods of collection may include self-removal (bussing), trolley or table collection and this must be decided in the initial planning stage.

Method	Considerations
Self-cleaning, self-bussing	Applies to employee and institutional catering where the users are familiar with the system. Requires special trays designed to be used on the tables. Design of collection point is critical – adequate counter space, shelf heights, circulation space, provision for hygiene. Layout planned to allow direct transfer of dishes from the collecting point to the washing-machine loading racks

Trolley or cart collection	For self-service cafeteria and concentrated service. Layout of tables and seats must allow circulation without congestion or crossing near main entrances or exits. Aisles 1,050 mm (3½ ft) wide. Requires special trolleys designed for easy use, minimum disturbance, concealment of waste. Deposit point adjacent to servery (for return of dishes) with space for trolley parking and direct unloading. Provision for trolley and tray washing
Table collection	By waiting staff as part of table service. Layout more flexible. Stations or sideboards may be required for trays. Deposit point located adjacent to but screened from the servery. First stage in circulation. Must allow shelf space for accumulating serving dishes and tableware

Machine washing, usually at 60°C (140°F)	May be partly or fully automatic. The water pressure may be critical. Detergent added. Water softening usually required. Drainage connection and ventilation extract
Final rinsing, usually at 88°C (190°F) (with booster heater)	Allows sterilisation and rapid drying. At lower temperatures a sanitising and draining agent must be added to the rinsing water
Unloading of racks	Space for drying, unloading direct to trolleys or mobile units for return to servery
Energy recovery option	With energy transfer to pre-heat water inflow by (a) waste heat in drainage water, (b) waste heat and condensate in ventilation extract

The dishwashing area should generally be adjacent to the servery to allow the return of clean dishes for further use. If the collection point is remote, the trayed dishes may be taken to the dishwashing area by conveyor belt (screened from view, but accessible for attention). Alternatively, dishwashing may be located near a suitable collecting point and clean dishes returned to the servery by trolley.

5.04 Dishwashing

Dishwashing may be carried out manually or by machine.

Manual washing requires drained bench space for collecting and scraping dishes before washing and for draining washed dishes after they have been rinsed. A double sink with removable gratings over the outlets and overflows is essential.

Manual washing is suitable for small restaurants and bars serving up to 50 meals/hour. However, it is expensive in that it occupies an employee continuously.

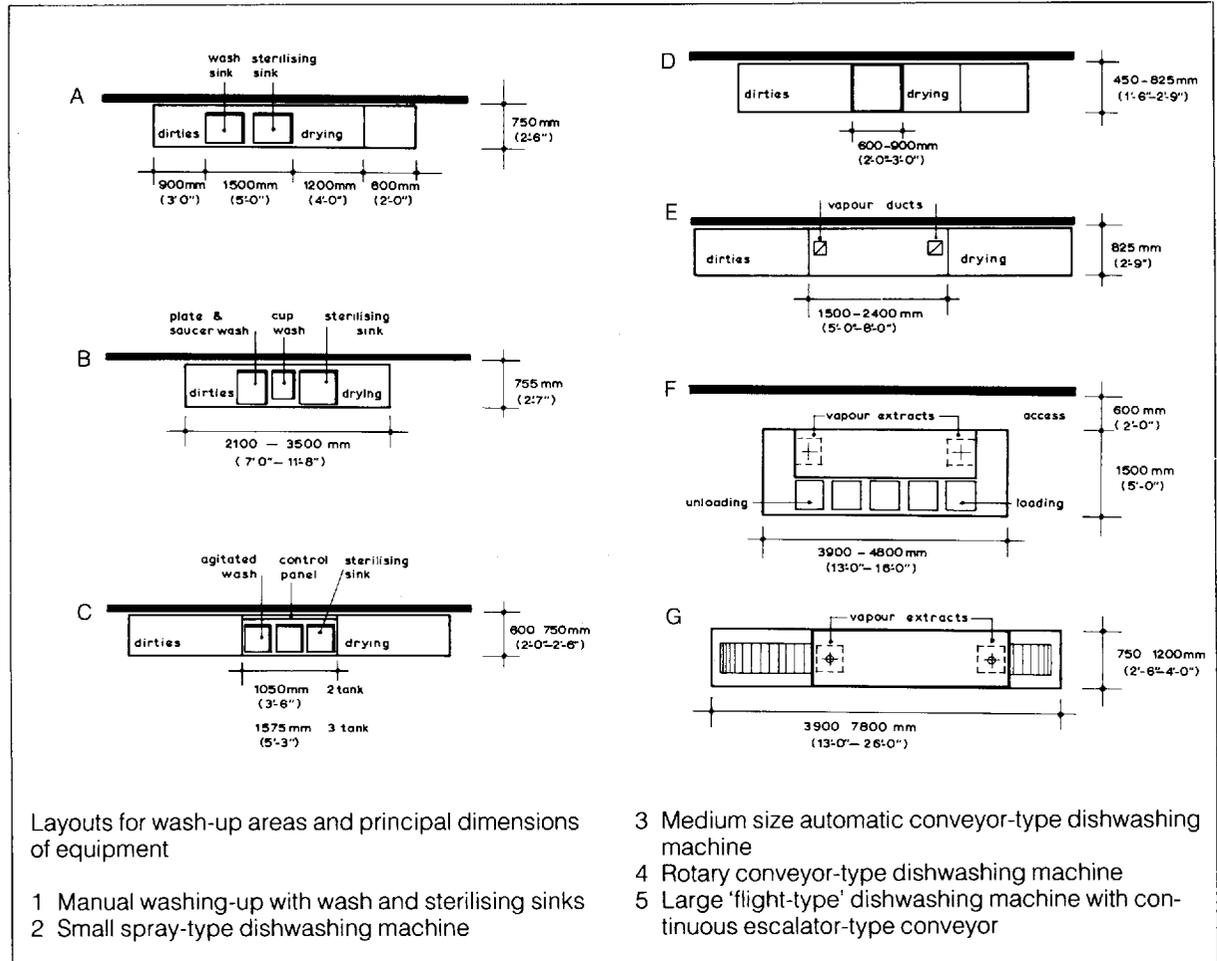
In machine washing six main stages are involved:

Stages	Considerations
Scraping of dishes, disposal of residue	Hopper set in benching over waste disposal unit or removable containers
Rack loading of machine	In trays, racks or direct to conveyor. Raised rim to reduce spillage
Pre-rinse	By hand sprays to sink or waste outlet or as first stage of machine wash

5.05 Dishwashing machines

Machine capacities are usually specified in terms of the numbers of pieces of tableware washed per hour (normally five per meal). Dishwashing machines may be manual, semi-automatic or fully automatic in loading and regulation. There are various types of dishwashers:

Type	Characteristics
Brush	Manual washing in a sink with rotating brushes. Rinsing in separate compartment
Agitated-water	Manual washing with turbulence by motorised impellers. Separate rinsing. For up to 300 meals/hour
Spray	Uses jet action of rotating spray to wash and rinse tableware placed in baskets or racks. With benching each side. Small machines may be sited in corner. Large equipment is usually free-standing with access to both sides
1. Small spray type. Semi-automatic	Single chamber loaded and emptied by hand. Washing and rinsing cycles. 100–300 meals/hour.
2. Medium-sized automatic conveyor type	Multiple compartments with racks conveyed mechanically through washing and rinsing stages. May be in-line or rotary. 400–500 meals/hour
3. Large spray-type 'flight' machines	Free-standing with adjacent benching. Continuous conveyor directly loaded. At least two operators required. Pre-rinse wash and rinse compartments. 500–1,000 meals/hour



5.06 Space requirements

Typical space requirements for dishwashing machines with the associated benching for loading and unloading may be summarised:

Collection area for unsorted tableware prior to sorting and scraping	600 mm length (24 in.) per 10 meals (a) Minimum 900 mm (3 ft) Maximum 2,400 mm (8 ft)
Stacking area for tableware sorted and stacked for manual washing	300 mm length (12 in.) per 10 meals (b) Minimum 800 mm (3 ft) Maximum 3,600 mm (12 ft)
Loading into racks for machine washing	Depends on rack/basket size. Minimum 1,000 mm (3½ ft)
Draining and drying in racks or baskets after washing and sterilising	Manual process and brush-type machines: Minimum 1,200 mm (4 ft) Conveyor or spray type machines up to 3,600 mm (12 ft)
Unloading baskets and racks for clean crockery awaiting removal	100 mm length (4 in.) per 10 meals Minimum 600 mm (2 ft) Maximum 2,400 mm (8 ft)

<i>Spray-type machines with mechanised conveyor systems</i>	<i>Space occupied by machine plus conveyor system</i>	
	Width	Length
Rotary conveyor type (600–1,000 meals/hour)	1,500mm (5 ft)	3,900–4,800mm (13–16 ft)
Flight type escalator conveyor (over 1,000 meals/hour)	750–1,200mm (2½–4 ft)	3,900–7,900mm (13–26 ft)

(a) Based on self-clearance. Smaller areas suitable where part stacking is provided.
(b) Assumes some accumulation of dishes while awaiting washing-up.
The lengths relate to tabling 750 mm (2½ ft) wide.

6. Constructional requirements

6.01 Cost factors

Food production is often located in relatively low-value areas (rear of premises, basement, secondary floors) and subject to constraints in space, shape and dimensions. Layouts have to be planned to fit these dimensions, adding to the cost of custom-built benching and fittings. Construction costs are high due to the high concentration

of engineering services and durable finishes required.

As a guide the median costs for a new food production area are indicated. In this case, the building costs are based on a single-storey, framed building in brick or block, with tiled interior finishes. The costs include ventilation and other services and catering equipment.

	Costs /m ² (1986)	
	£	%
Sub-structure Building envelope }	450	35
Finishes, fittings	135	10
Engineering services	315	24
Catering equipment	400	31
TOTAL	1,300	100

Note: Figures rounded.
Cost/m² generally range over $\pm 25\%$.

6.02 Equipment costs

Capital costs for buildings and food production equipment are shown separately. These are related to the number of meals produced per day (based on the peak meal period) and will depend on the sophistication of the engineering services and catering system installed. For highly systemised production (cook-chill, cook-freeze, fast food) equipment and engineering costs may increase to 62 per cent of the total.

6.03 Ceilings

Typical ceiling heights for food production areas are:

	m	ft
Large production kitchens	3.6–4.2	12–14
Small finishing kitchens	3.0–3.6	10–12
Stores, etc	2.4	8

Requirements for ceilings in food production and service areas depend on the installation of engineering services and access needs. The main provisions may be summarised:

Ventilation	System of ventilation: positions and dimensions of ducting, design of extracts and inflow diffusers or grilles. Access for cleaning, removal of filters
Engineering utilities	Arrangements for pipes, cables, conduits and equipment – including recessed, surface-mounted or suspended lamp fittings, sprinkler systems and terminal equipment

Vapour sealing	To prevent interstitial condensation. Sealing may be incorporated in the construction or as a surface film
Insulation	In a single-storey building the ceiling and roof must have a low thermal transmittance value: less than 0.97 W/m ² °C (0.17 Btu/ft ² h °F). Insulation material must be inert, non-absorbent and water repellent
Sound absorption	May be incorporated (see section 7.04) within construction

6.04 Floors

Floor construction and surfaces need to be non-skid, impervious and highly resistant to wear and damp. Floor repairs are difficult; they can be costly in terms of equipment disturbance and in the time the kitchen is out of use. In planning floor construction, attention must be given to:

- *intensity of use*: size, output and nature of use of the kitchen areas,
- *sub-floor construction*: structural constraints, screeding, falls for drainage,
- *engineering utilities*: ducts for cables, pipes, drains, access points,
- *equipment*: service connections, drainage, weights, temperatures,
- *loading*: overall and individual loads, point loading,
- *levels*: finished levels, steps, plinths and channels,
- *walls*: positions of wall partitions, foundations, coving.

Drainage channels are usually provided around islands of equipment to receive drainage from the appliances as well as for floor washing. To facilitate washing, all floors must be laid to falls (1:120 slope) to drainage outlets in the form of channels or trapped gulleys covered by removable grating.

Floor structures must be capable of supporting the superimposed weights of filled equipment which may need to be located in centre span positions. As a guide, typical weights of individual cooking appliances are in the order of 150–300 kg (330–660 lb) per unit for medium duty equipment and 200–400 kg (440–880 lb) or more for heavy-duty appliances.

All *joints* in tiling and other junctions must be sealed with smooth, impervious, acid-resisting mortar. Special sealant is required for expansion/contraction joints. Junctions between walls and floors and corners must be rounded (coved).

6.05 Flooring materials

Selection of flooring materials depends mainly on location and intensity of use:

Materials	Typical uses
<i>Jointless flooring and in situ finishes</i>	
Granolithic cement, sand, hard aggregate in ratio 1:1:2, on mature concrete base: 40 mm thick in bays of 15 m ² , monolithic construction: 20 mm thick in bays of 30 m ² . Must incorporate non-dusting surface hardeners, abrasive, non-skid finish	Storage rooms, passages, stairs
Incorporating metal paving and grid floors, including metal trays or polyester resin fibre reinforcement	Loading docks, access covers
Terrazzo decorative concrete with marble chippings. May use epoxy resin binders. Also used as tiles. Must incorporate non-skid abrasive (carborundum)	Halls, serveries, public circulation areas
Epoxy resins spread 2.3 mm on concrete floor or using epoxy/filler mixes. Must have non-skid, inert surface. Use of hardeners can cause odour taint. Edges protected	Stores. Repair or resurfacing of existing floors
<i>Jointed flooring</i>	
Floor quarry tiles, fully vitrified (less than 0.3% absorption) with non-skid surface. Standard tiles 19 mm thick laid to 100x100 mm or 100x200 mm module, allowing for joints	All kitchen and dishwashing areas
Ceramic floor tiles, fully vitrified, with ribbed or studded non-skid surface. Semi- or unglazed	
Concrete tiles with carborundum, non-skid surface. Standards of hardness, resistance and impermeability specified 100 mm module. Range of colours	Possible alternative
<i>Resilient flooring</i>	
Rubber flooring or tiles with non-skid, patterned surface. Treated to resist oil, grease, acid, with sealed or welded joints. Floor damp-proofed	High traffic areas, concourses
Polyvinyl chloride reinforced with glass-fibre, with aluminium oxide, silicone carbide or quartz aggregate laid in seamed sheets. May incorporate smoke inhibitor and bacteriostat. Floors must be damp-proofed. Liable to be damaged by heat, cutting and impact or excessive wetting	Small kitchens, serveries, corridors

6.06 Walls

The walls of food production areas may be considered in two parts. The lower part, up to 1800 mm (6 ft) may be exposed to splashing, spillage, frequent washing and cleaning, possible scraping and impacts from utensils and heating/cooling due to proximity of equipment, pipes, etc.

Materials	Areas
Glazed ceramic tiles with acid resisting joints on flat, cement rendered base or laminated sheeting (inert)	Kitchen and service area
Ceramic and glass mosaics, decorative glass blockwork	Featured display areas
Plastered walls with non-toxic, protective coatings (chlorinated rubber and emulsion paints)	Stores, lightly used areas

The upper part is less liable to damage. Considerations include:

- to prevent condensation the thermal transmittance value for external walls should not exceed 1.14 W/m² °C (0.2 Btu/ft² h°F),
- if porous plaster or linings are used the surface must be vapour sealed,
- sound absorption may be required (serveries),
- white or pastel colours preferred for light reflection and distribution and hygienic appearance.

The upper walls may be plastered and painted in kitchens and stores, allowing for periodic washing and redecoration to maintain standards.

6.07 Splashbacks

Areas of walls behind sinks, washbasins, stoves and other equipment require special protection. The design of the equipment may incorporate a raised rim or sheet of stainless or enamelled steel to confine splashing and staining.

6.08 Partitions

Partitions are frequently used to provide a physical barrier to noise, view, steam and fumes (e.g. in dishwashing area), or to separate areas such as a chef's office or serveries.

<i>Types of partition</i>	<i>Characteristics</i>
Lightweight, not designed to support heavy equipment or large shelving May have glazed panels or windows for supervision	Frames of aluminium or rust-proof steel with sheets of plastic laminate, aluminium, glass-fibre reinforced polyester, etc, depending on situation De-mountable to allow re-arrangement or alterations
Heavy framed, with framework positioned and anchored to provide fixing for equipment	Stainless steel or aluminium sheeting
Solid, to provide backing or support to equipment. May incorporate framing	Moisture and heat-stable blocks, cement rendered and tiled

6.09 Doors and windows

Natural light is preferable in food preparation areas (for psychological reasons, for easy colour differentiation, to save energy) but precautions must be taken against potential problems:

<i>Potential problems</i>	<i>Possible precautions</i>
Damage from heat, steam and fumes	Equipment positioned away from windows. Windows must not hinder fire escapes.
Solar heat and glare	North facing roof lights. Windows angled or screened against sun
Variable illumination over work areas	Wide, high, level windows clear of equipment and benches. Sill height minimum 1200 mm (4 ft). Supplemented by local luminaires (colour blended)
Condensation of moisture and oil	Roof lights angled steeper than 30 degrees. Drainage channels and outlets provided. Access for cleaning
Draughts at work level, and over equipment	Opening windows and ventilators baffled. Positions of equipment checked for flame disturbance, and extract efficiency
Opening mechanism	Operable from floor level. Adjustable vents
Insect entry	Fine mesh screen fitted over ventilators and openings
Noise emission	Effect on surrounding rooms (hotel bedrooms, private property, conference rooms, etc) considered
Dirt	Windows should be flush with adjacent interior surfaces. Metal framed

Both external and internal doors are subject to intensive use in food production and service areas. Design requirements appropriate for most situations are summarised in section 2.06 (External doors) and Chapter 6, section 1.02 (Internal doors).

6.10 Hygiene

Hygiene requirements are laid down by the Food and Drugs (General) Regulations 1970 in the United Kingdom. Similar provisions apply in the United States.

In relation to the construction of food premises the Regulations cover the following requirements:

Any article or equipment with which food comes into contact	Must be non-absorbent, capable of being thoroughly cleaned and prevent risk of food contamination
Walls, floors, windows, doors, ceilings and other parts of structure	Maintained in a condition which will enable them to be kept clean and prevent risk of infestation by rodents or insects
Location of food rooms	Must not communicate directly with a sanitary convenience or sleeping place
Lighting and ventilation of food rooms	Suitable and sufficient means of lighting and ventilation must be provided and maintained
Temperature of certain foods which can cause food poisoning	Foods not for immediate consumption must be kept above 62.7°C (145°F) or below 10°C (50°F)
Waste food and refuse	Suitable provision for the removal and proper storage
Sanitary conveniences	Must be properly located and maintained
Washing facilities for food and equipment	Proper supply of hot and cold water with sinks and other facilities
Hand washing	Separate basins with appropriate washing and drying facilities
Locker accommodation	Provisions for outdoor or other clothing and footwear
First aid facilities	Clearly identified

These provisions are extended by legislation dealing with public health generally (Public Health Acts), the health and safety of employees (Offices, Shops and Railway Premises Act and Regulations) and licensing requirements (Licensing Acts and By-laws).

Sanitary conveniences and washing facilities	Adequate and suitable for the numbers of customers and employees. Separate provision for the sexes
Safety of workplaces used by employees	Including safe means of access, proper guarding of moving parts and other protection
Drainage of floors, lighting and ventilation, supplementary heating	Adequate provision to be made, including suitable temperatures for workplaces
Accumulation of debris, risk of congestion	Facilities for proper storage and removal of waste
Means of escape in event of fire	Provision for protection and safety of employees and customers

These standards may need to be increased;

- in kitchens where no natural light is provided,
- for large-scale production areas where high speed and precision is required (750 lux for production lines),
- where older workers are employed (50–100 per cent increase).

7.02 Natural light

Natural light is again preferable in both dining rooms and work areas for its psychological effects, etc.

In overcast conditions in Great Britain (5,000–6,000 lux) the window design should provide:

Rooms with side lighting	Daylight factors		Supplemented by electric lighting
	Minimum	Average	
Cafeterias, dining rooms	2%	5%	Below 1%
Kitchens, preparation areas	3%	5%	Below 2%(a)

(a) In addition to local lighting over equipment and services.

The distribution of daylight will depend on the depth of room and height and width of windows (see section 6.09). Supplementary electric lighting should be colour balanced and positioned to avoid creating strong shadows or contrasts.

7.03 Artificial light

Calculation of lighting requirements (interior lighting load) to give a desired level of illumination must take into account the proportion of the light from the fitting which reaches the work top. This will depend on:

- the proportions of the room and mounting

7. Engineering services

7.01 Lighting

Good lighting in food production and service areas is essential:

- to ensure cleanliness of the premises and equipment,
- in checking food for quality and extraneous matter,
- for skilled operations in preparing, decorating and serving food,
- for the comfort of employees, allowing faster and more accurate working with reduced physical and mental strain and irritation,
- to reduce excessive contrasts and risk of accidents,
- in serving food to provide an attractive display.

The levels of illumination recommended under the Illuminating Engineering Society (IES) and Chartered Institution of Building Services Engineers (CIBSE) Codes are as follows:

Situation	Standard service illumination		Limiting glare index	Notes
	lux	lumens/ft ²		
General area of kitchen	300	30		Uniformly distributed
Preparation: work surfaces	500	50	22	For fine decoration – 750 lux
Cooking equipment	500	50		Positions of luminaires
Washing-up section	500	50		For inspection – 750 lux
Serving counter, bar	300–500	30–50	22	Local screened luminaires
Stores, cellars	150	15	25	
External yard	30	3		
Restaurants generally	100	10		Additional table lighting
Cafeterias, coffee bars	150	15		
Cash desks	300	30	19	Local screened luminaires
Corridors, passages	100–150	10–15		Graded illumination

height of fittings (room index),
 — utilisation factor depending on the room index, type of fittings and reflectance factor of the ceilings and walls,
 — light loss factor due to obscuration by dirt and staining on the luminaires.

Required lumen output (installed flux)

$$\frac{\text{illuminance} \times \text{area}}{\text{utilisation factor} \times \text{light loss factor}}$$

For general diffused light in a food production area with high wall and ceiling reflectances (0.7), utilisation factors are usually in the order 0.4–0.6.

As an approximate guide, the lighting loads required to give correct levels of illumination with diffusing light fittings are as follows:

Illumination provided lux	Total wattage required/m ² (a)		
	Incandescent (200 W)	Fluorescent White (65 W)	De luxe warm white (65 W)
150	26	6	9
300	52	12	18
500	—	20	30

(a) Based on trough reflectors: increased by 25 per cent for enclosed fittings.

As well as to light intensities, consideration must be given to:

- contrast – sufficient directional variation of light to perceive depth, distance and texture,
- glare – avoidance of excessively bright areas (exposed lamps, sunlight, reflecting surfaces) within field of vision while working,
- shadow – sufficient background lighting to minimise dark shadows forming around and in equipment.

A number of factors affect choice and location of light fittings:

Steam and fumes	Fittings should be anti-corrosive and preferably sunk into the ceiling
Location	Over the whole area, for general illumination. Greater concentration over work areas. Around or within ventilator hoods. Within large equipment
Fluorescent tubes	Used almost universally because of high efficacy, low heat output, long life, availability in range of wattages and colour variations
Colour	High efficacy halo-phosphate lamps tend to emphasise cool colours of the spectrum. Warm colour renderings are generally at lower efficacy but new generation tri-phosphor lamps give good colouring with high efficiency output

Replacement	Nominally 7,500 hours, allowing for decreasing output
Efficiency	Typically 37–90 lumens/W
Standard sizes	1,200 mm (common), 600, 900, 1,050, 1,500, 1,800 and 2,400 mm. Tube diameter: 38 mm (common), 26 mm (energy saving)
Fittings	Tube battens, dispersive metal reflectors, diffuser suspended or fixed to ceiling
Incandescent lamps	Used in displays, dining areas, emergency lighting. Decorative infra-red lamps used over hot counters
High-pressure mercury discharge	Used in departmental stores, large concourses, sports areas, gymnasias
High-pressure sodium discharge	For external car parks, unloading docks, floodlighting of buildings

7.04 Acoustics

A considerable amount of noise is generated in the kitchen by machinery, water and gas jets, banging of metallic surfaces and by other sources, including the workers themselves.

The noise level is accentuated by reverberation within the room, sounds being prolonged by:

- multiple reflection from the hard surrounding surfaces,
- relatively large volumes.

Design requirements should consider the following:

Noise climate

Because of difficulties in communication, masking of speech and the tiring and irritating effects of continuous exposure to loud background noise, sound pressure levels should be kept mainly below 55–60 dBA.

Areas	Decibels	Noise rating (NR) curve (a)
Large production units	55–60 dBA	50
Smaller units	50–55 dBA	45

(a) Preferred noise criterion curves: similar number.

Confinement

The main sources of noise, such as dishwashing areas, should be screened from other parts of the kitchen.

Background noise in restaurants

Acceptable noise levels in restaurants depend on the degree of activity and throughput, for example:

	NR
Cafeterias	40–45
Restaurants	35–40
Private dining rooms	30–35
After-dinner speeches	25–30

To some extent the level of acceptable noise depends on the social atmosphere and environment (lighting, colour, activity). An atmosphere that is too quiet might be a less enjoyable one, and could put people off.

Insulation and baffling

Insulation requirements for partition walls between the kitchen and restaurant areas depend on the proximity of seating and extent of activity in the restaurant.

Typical insulation standards	Sound transmission class (STC)
Restaurants	40–45
Private dining rooms	45–50
After-dinner speeches and multi-purpose conference rooms	50–55

In addition to separation by walls or partitions, provision should be made for screening or baffling the opening doors from nearby seats. In multi-purpose conference rooms, food service may be through an intermediary lobby providing noise isolation from the production area.

Sound absorption

Sound absorbing materials are porous or resilient and their use in food areas is limited to

- ceilings and upper areas of walls,
- adjacent service corridors.

To allow easy cleaning and redecoration the exposed surfaces must be of hard, durable material perforated to enable sound waves to penetrate to a porous or hollow backing. The backing must be inert to water vapour and oily fumes and, preferably, be water repellent. Typical constructions include perforated metal ceiling trays with glass or mineral wool backing.

Impact noise

Reduction in impact noise can be obtained by damping the resonance of thin metal surfaces (absorbent backing), providing counter balanced hinged lids, spring and magnetic closures and buffers and stops.

7.05 Ventilation and heating

The ventilation system of any kitchen must:

- remove heat, steam, fumes and oil droplets in suspension in order to prevent condensation, staining, escape of cooking smells, and increase of temperature and humidity in the kitchen and adjacent rooms,

- control the air inflow to ensure proper distribution and prevent draughts.

These conditions must be under control at peak periods of activity.

Natural ventilation of kitchens is suitable only for small-scale operations (up to 50 meals/day) and where extensive frying is not involved. High-level outlets (lantern lights, roof ventilators) must be provided over the main cooking area.

Mechanical extraction or exhaust systems are required in most situations to ensure control over movement of air and filtering of impurities. Condensation of water vapour and oil fumes is most effectively controlled by confining these to the production area and removing them by air extraction in this area. Measures for controlling condensation, etc, include:

- canopies and hoods over cooking appliances,
- air funnels over surface of fryers,
- enclosures around dishwashing machines,
- directional flow to ceiling extracts.

The velocity of air flow must be sufficient to ensure the particles remain entrained in the air stream. This is partly determined by the design of the canopy and is dependent on the amount of air extracted.

For steam and fume removal, velocities of 0.02–0.05 m/s (40–100 ft/min.) are necessary at the face of a canopy but excessively high velocities are liable to cool off the cooking services and to interfere with the burners and pilot lights.

7.06 Standards of ventilation

Standards for kitchen ventilation may be based on

- number of air changes/hour in the kitchen, or
- rate of air removal for each appliance.

7.07 Ventilation systems: extraction and airflow

The extraction system for food production areas is usually based on localised plant. Provision must be made for filtering out grease and condensation, access for cleaning (preferably with an integral washdown system), fire safety and isolation. In most new installations, it is feasible to install thermal recovery equipment using direct regenerative or recuperative transfer to warm incoming air, or indirect heat pump systems (e.g. for dishwashing exhausts). Examples of systems include:

Area	Temperature (a)		Air changes/ hr	Notes
	°C	°F		
Cooking section	—	—	20–60	Where the heat output is large in relation to the volume of the kitchen the higher rate of air change is necessary
Vegetable preparation	15.6	60	2–3	Local supplementary heating usually required
Pastry preparation	15.6	60	2–3	Preparation areas included in the same room as cooking appliances require 10–25 air changes/hr
Meat and fish preparation	15.6	60	4–6	
Servery	15.6	60	5–10	Mechanical ventilation necessary unless adjacent to external wall
Pan wash and manual wash-up	15.6	60	6	Large automatic dishwashers require individual steam exhaust outlets
Staff rooms and offices	18.3	65	1½–2	Separate natural ventilation preferable
	18.3	65	4–6	For internal rooms mechanically ventilated

(a) Temperature requirements based on an outside temperature of -1.1°C (30°F).

Extraction systems	
Extract over equipment balanced by inflows through natural ventilator openings	Inlets positioned to avoid draughts causing discomfort or shortcircuiting. Air velocities through non-mechanical ventilators should not exceed about 1.0 m/s (200 ft/min.). To avoid steam and cooking smells in the dining area, 10–20 per cent more air is extracted than inlet system provides, this imbalance being maintained under all operating conditions
Combined exhaust and supply air systems (using direct heat pipe to transfer thermal energy to make-up air)	Supply air and exhaust ducts fitted in parallel using a combination exhaust/supply fan and thermal recovery unit to temper the make-up air. The air inflow is discharged through grilles and diffusers in the side of the extraction canopy
Inducted exhaust systems using a ducted high-velocity air inflow to create a low-pressure extraction zone over the equipment	Fan driven outside air (70–80 per cent of exhaust volume) is discharged through slots into the exhaust canopy extracting heat and conditioned air (20–30 per cent of volume) from the room. The conditioned air may be supplied through ceiling slots or diffusers in the kitchen and servery

In most commercial restaurants the inflow of air is conditioned and mechanically distributed by plenum fan and ducting system (see Chapter 6). The rate of air extraction in kitchens, serveries and WCs must be properly balanced. Air extraction over a servery or bar area is usually balanced by directional air inflows in front of these areas.

7.08 Ventilation ducts and canopies

Canopies may be constructed of stainless steel, anodised aluminium, galvanised steel or translucent panels of reinforced glass or fibreglass. The area of a canopy will be determined by its height and extraction rate but, typically extends about 150 mm (6 in.) outside the cooking area. Where grilling or frying is included, the inlet to the ventilating duct must be fitted with grease filters and automatic dampers should be incorporated as a fire precaution. Some filtration and condensation removal is desirable in every case to minimise risk of staining and leakage from the ducting, and all filter units must be easily accessible.

Unless carefully designed, canopies and ducting tend to interfere with light distribution and create unsightly obstructions which add to cleaning work and to the heat radiated into the kitchen.

The sizes of exhaust ducts are normally based on velocities of about $7.7\text{--}10.2\text{ m/s}$ ($1,500\text{--}2,000\text{ ft/min.}$) to reduce settlement of dirt and grease while minimising the tendency to vibration noise which occurs at higher velocities. The area across the filters is increased to limit the velocity to

about 1.5–2.0 m/s (300–400 ft/min.). Where possible, the ducting should be incorporated in the ceiling space and the canopy sited in a position which will permit a short, direct line to the outlet terminal.

In selecting the extraction fan and associated equipment, consideration should be given to:

- the need to satisfy varying conditions, e.g. by regulating the rate of extraction or part recirculation of air,
- avoidance of overloading, excessive noise, vibration, corrosion and the build up of grease and dirt,
- access for maintenance, and
- the need for duplication of fan machinery for servicing and repairs.

7.09 Temperature

Regulation of temperature is largely a matter of ventilation, i.e. the removal of heat generated by cooking appliances, hot cupboards, dishwashing and the occupants themselves.

Extremes of temperature – over about 25°C (77°F) – with high humidities, may cause extreme discomfort and accelerate food decomposition and the growth of food poisoning organisms. In addition to high ambient temperatures, radiation from the proximity of hot surfaces must be considered (insulation, surface protection).

Low temperatures can also produce problems from condensation, risk of water freezing and discomfort to employees engaged in such dull, repetitive work as vegetable preparation or meal assembly. Supplementary space heating (local or centralised) may be required for intermittent use in food preparation areas as well as in ancillary rooms (offices, cloakrooms, changing facilities).

7.10 Hot and cold water supply

Large quantities of both cold and domestic hot water are used in a kitchen and the probability of water being drawn off simultaneously at a number of points necessitates large pipes. To minimise cost of pipework, the cold water storage cistern and calorifier or water heater should be sited as close as possible to the kitchen. The main hot and cold pipes may be enclosed in a duct or chase but each must be well insulated to reduce transfer of heat from one pipe to the other. Stopcocks and drainage points must be provided for each main section and, as far as possible, the mains pipework should form a closed network rather than long, isolated branches.

Water supplies are normally required at the following points:

Connection	Cold water	Domestic hot water
Drinking-water points	✓ (a)	
Vegetable preparation sink	✓ (a)	✓
Other food preparation sinks	✓ (a)	✓
Boiling pans	✓ (a)	
Water boilers and café sets	✓ (a)	
Steaming ovens	✓	
Potato peeler	✓	
Waste-disposal unit	✓	
Pan wash	✓	✓
Wash-up sinks	✓	✓
Rinsing/sterilising sink	✓	✓ (b)
Dishwashing machine	✓	✓ (b)
Cleaners sink	✓	✓
Lavatory basins in cloakrooms and kitchen	✓	✓
WCs	✓	
Tap and hose for refuse bins	✓	

(a) Water supplies for drinking and for washing food, etc. should be taken direct from the service pipe. All other cold water supplies are connected to the distribution network.

(b) Hot water used for rinsing and sterilising should be supplied at a temperature of 82°C (180°F). This may be obtained by locally boosting the temperature of the hot water normally distributed or through an independent supply.

The normal temperature of hot water supplied to sinks is 55–60°C (130–140°F). Where possible, washbasins should be supplied with water at a slightly lower temperature – about 50°C (120°F) – and water for hand washing may be conveniently supplied through a mixing valve at a suitable temperature for use with a spray (see Chapter 6, section 6.01).

7.11 Quantity

The total quantity of water required per main meal varies from about 7 l. (1½ gals) up to 18 l. (4 gals), depending on the type and size of catering involved. In particular, dishwashing machines, waste-disposal units and vegetable preparation account for a large proportion of the water usage and the latter figure includes staff WCs and wash basins.

Water supply authorities generally require 1–2 days' supply of water to be stored in the premises. The peak demand for cold water is likely to produce flow rates of up to 7 l./h (1½ gals/h) for each main meal prepared. Demand for hot water is mainly concentrated into the short periods coinciding with the service of the meals and immediately following when washing-up takes place. Hot water storage, based on a 2 hour recovery period, is approximately 2.7 l./meal (0.6 gals/meal).

7.12 Drainage

Discharge of waste from cooking appliances grouped in an island arrangement may be into open channels which also serve for floor drainage. The channels are usually constructed of semi-circular glazed units laid to falls and covered by grating which must be removable for cleaning.

Although this method provides for economy and flexibility, open channels conveying hot water are liable to emit steam and the gratings tend to harbour dirt. An alternative arrangement is to discharge the waste and cleaning wash from each appliance to an individual waste pipe extending under the floor to a suitable trapped gulley, situated, where possible, outside the building.

Sinks, potato peelers, dishwashing machines, waste-disposal units and similar appliances producing waste with a high proportion of solids must be discharged direct to individual waste pipes and, for this reason, are best sited near outside walls.

8. Energy use

8.01 Energy consumption

Energy consumption in restaurants and catering operations falls largely into two categories:

- *environmental*: space heating, air-conditioning, ventilation, lighting. Energy costs per meal will depend on the location, type of building space, sophistication of standards, operating hours, seat utilisation and turnover,
- *operational*: food production and service, including food storage and dishwashing. Energy costs per meal depend on the extent and variety of equipment used.

Energy units may be expressed as:

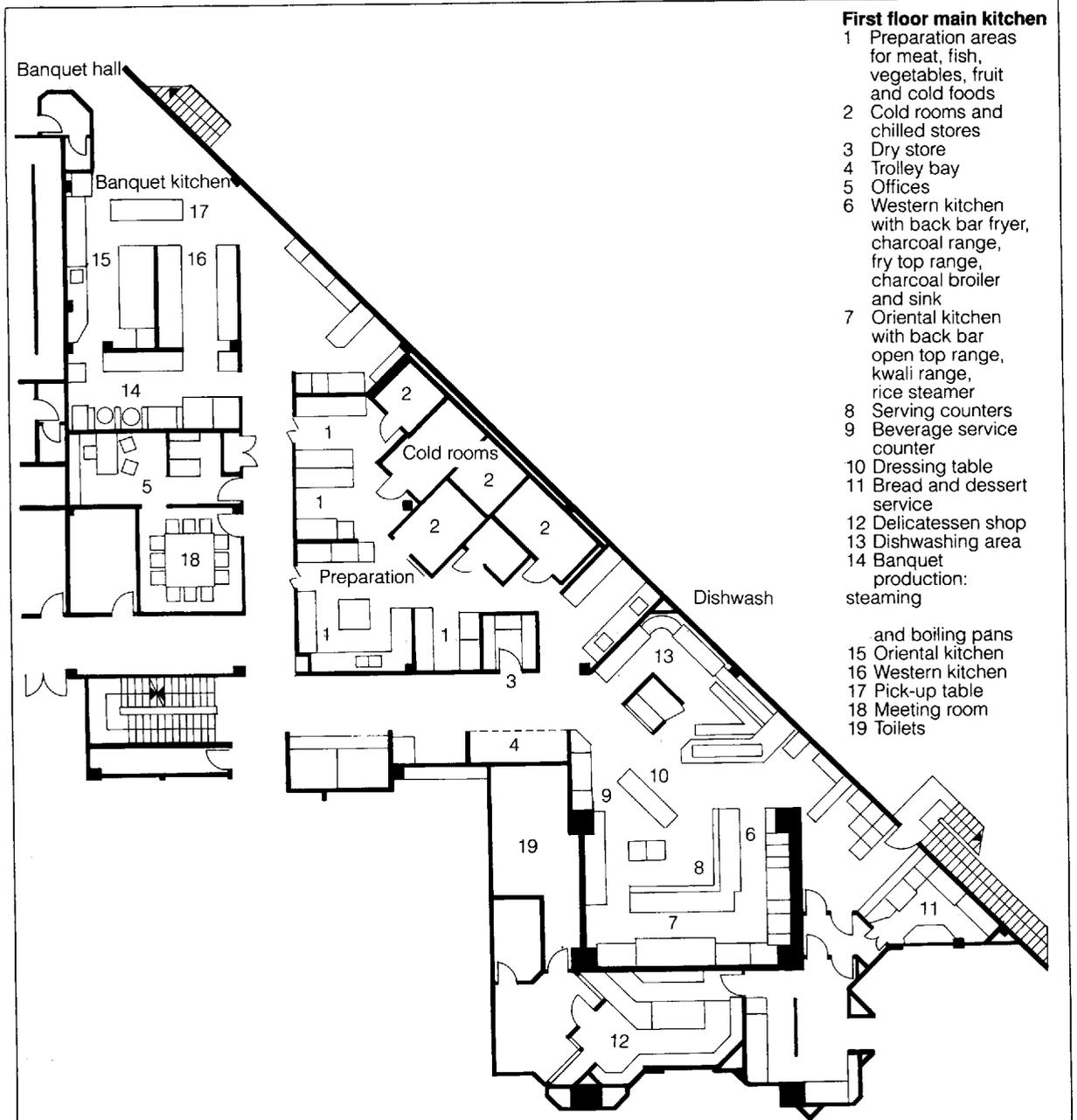
Megajoule (MJ)	Kilowatt-hr (kWh)	Therm (100,000 Btu)
1	3.6	0.0095
0.278	1	0.0026
105.5	379.8	1

Overall energy costs per meal vary widely from less than 10 MJ for snack meals to over 65 MJ for meals in hotels. With good design and management the following norms should be achieved:

Type of establishment	Norms: energy costs per meal		
	Environment MJ	Operation MJ	Total MJ
Snack bars, counter meals	2-4	4-5	6-9
Store restaurants, coffee shops	5	7	12
Steakhouses, speciality meals	7	10	17
Full service, family restaurant	8	11	19
Hotels, high-class restaurants	10-14	30	40-42
Hospitals, institutional catering	4-6	10	14-16
Employee catering services	7	9	16

These figures represent about 25 per cent saving on existing practice.

Main area of energy use	% of total energy	
Heating, ventilation, air-conditioning	25-30	} Usually about 40% of total. Less if the restaurant is used extensively
Lighting	10-20	
Food storage, production, service	30-40	} About 60% of total rising to 70% in hotel restaurants
Dishwashing	10-20	



Hyatt, Aryaduta, Jakarta

The main food production area of the Hyatt Aryaduta (under construction 1986) is located on the first floor adjacent to the restaurants and banquet rooms. The facilities include extensive cold storage, separate preparation areas, cooking sections for Western and Oriental food with separate serving counters. The food service area also includes a bread and dessert counter, delicatessen shop and dishwashing facilities.

Much of the equipment – including Chinese steamers and kwali ranges – and counter layout has been custom designed by the consultants. Total energy loading for the main kitchen:

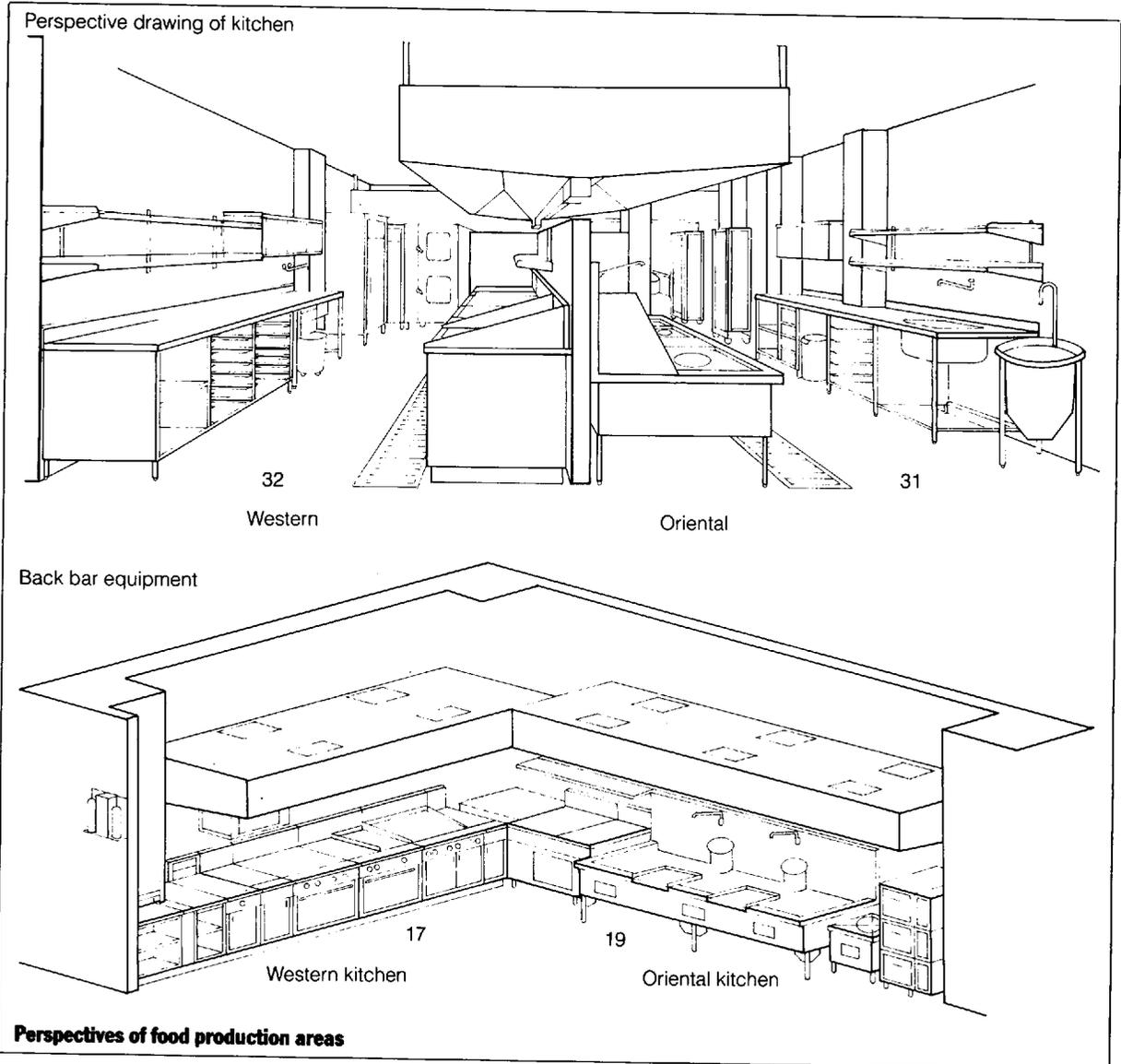
connected electric load	101kW
gas consumption	(81,600 Btu)
steam	125 kg/h
kitchen exhaust	51,700 m ³ /h

make-up air	36,200 m ³ /h
total equipment weight	2,763 kg

Plans of main kitchens; perspective views of food production and service areas.

Food service and laundry consultants: Christian K. Potzold, Consultants, Singapore
 Clients: Hyatt Hotels

Entrance and ground floor of a small restaurant with separate self-service counters for hot meals, cold dishes, coffee and drinks arranged octagonally around the circulation area.



8.02 Equipment performance

The installed equipment ratings for food production areas are usually in the order of 1.8–2.0 kW/m². This high loading on utility services arises mainly from the cooking equipment.

The energy profiles (rate of energy use over time) of cooking equipment show wide variations, for example:

- large, mass, high volume ovens, boiling pans, etc. require a long pre-heating period and long cooking cycles per batch of food,

Type of equipment	% of total loading	Characteristics of demand (typical)
Cooking equipment	80–85	Highly peaked during cooking and serving periods (2–4 h)
Storage and preparation	1–4	Intermittent over 24 h (increasing before meal period)
Service counters	9–10	Constant demand during service (2–2½ h)
Dishwashing	2–8	Highly peaked over short period following meals (2 h)

- forced air convection ovens and steamers have a more widely fluctuating energy demand with a high initial absorption,
- fryers and grillers (broilers) consume high rates of energy flow over short cooking cycles with repeated use during each meal period,
- micro-wave equipment has a relatively low energy input for short periods of intermittent use.

Most of the energy is used in pre-heating the equipment or is lost to the environment. At best only some 14 to 33 per cent of the energy input is absorbed by food and less if the equipment is under-utilised or defective.

In well-organised systems, energy costs for food production and service (excluding dish-washing and hot water supplies) should achieve certain targets:

	MJ/meal	MJ/kg
High output, limited choice	2-4	5-10
Medium output, varied meals	5-7	12-18

8.03 Operational developments

Significant changes in food service operations have been brought about partly by socio-economic changes in consumer attitudes and partly by the pressures of competition and cost sensitivity, leading to greater rationalisation.

Key changes affecting energy use include:

- *systematisation*: growth of fast-food outlets and restaurants or coffee shops offering a limited menu, mostly prepared from convenience food, which can be highly systematised with emphasis on high volume turnover, lower cost operations,
- *speed and efficiency*: savings in capital investment achieved with smaller, more efficiently planned kitchens using less cooking equipment but with generally faster cooking and regeneration,
- *management information*: introduction of computerised information systems to monitor and control performance, including energy costs,
- *large scale production*: development of programmed batch or continuous cooking equipment with automated controls,
- *environmental regulation*: use of local or integrated controls (see section 8.05)

8.04 Developments in equipment

Among the developments in equipment design which have a significant impact on energy consumption are:

Equipment	Developments
Microwave ovens	Pulsation, variable output intensity; combined with convection, radiation processes; used with food conveyors (tunnel ovens)
Induction heaters, halogen elements, pressure sensors	For rapid, controllable energy transfer to utensils
Forced air convection, pressure steam	Increased velocity, turbulence, pulsation and jet action, controlled variation
Infra-red systems	Tiered banks of heating elements between shelves of food
Pressure frying	Combined effect of steam pressure (moisture in food) and high temperature frying
Controls	Solid state controls to provide greater sensitivity over temperature, time, programmes

8.05 Environmental standards

Energy requirements for heating, ventilation, air-conditioning and lighting generally represent an annual loss of between 1,300 and 2,500 MJ/m², depending on the location, air-conditioning and periods of use.

Targets recommended in Great Britain:

Type of premises	Energy use/seat/year MJ
Snack bars	2,000
Counter meals, most restaurants	2,500-3,500
Hotels (public restaurants)	5,000
Hospitals, institutions	4,500
Employee catering services	3,000

Methods of energy saving include:

Building design and alterations	Wall cavity foam/dry fill and ceiling insulation. Double glazing (retrofitting expensive). Window screens and shading. Decorative wall lining panels with insulation
Energy production	High efficiency boiler installation and maintenance. Solar energy (depending on location) supplemented by off-peak heating for hot water supplies, swimming pools, etc. Integrated lighting and air-handling systems

Distribution	Zoned control of heating and air-conditioning. High performance calorifier/direct heated boilers with short distribution of hot water supplies. Insulation of pipes and ducting. Use of spray taps and economy devices
Automated controls	Local controllers for particular functions (maximum demand regulation, optimum stop/start, outside compensation, programmed zone controls). Integrated energy management systems with central control, remote sensing and satellite monitoring

- indirect transfer using heat pumps in exhausted air from dishwashers, swimming pools, kitchens, condensers, etc,
- combined processes, e.g. refrigeration (air-cooling/water heating) with local power generation (power-water) or air-heating with lighting (integrated lighting and air-handling).

8.08 Economics of energy use

Annual energy consumption of the food services industry in Great Britain was estimated to be over 77.770 million MJ (about 1.4 per cent of the total national energy output) at a cost of £427 million in 1983.

8.06 Energy recovery systems

Investment in energy recovery has to be considered in terms of:

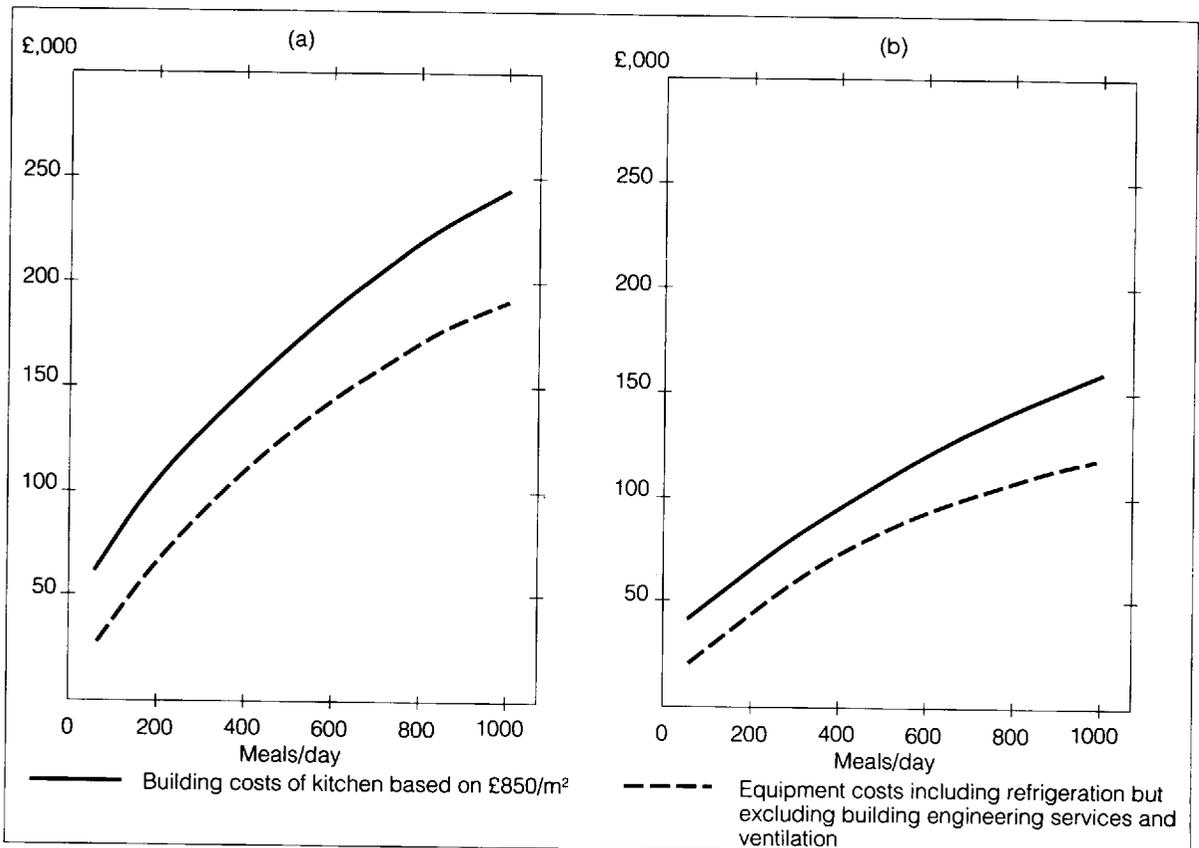
- commercial feasibility: cost savings should normally give a capital pay back within 1–3 years,
- practical requirements: problems of additional maintenance, cleaning,
- effect on operation: extra costs and difficulties of use and supervision.

8.07 Examples of energy recovery systems

- direct transfer of heat from exhaust ventilation, dishwashing waste, etc, using regenerative or recuperative methods (cross flows, thermal wheels),

Sector	Energy cost/year (1983)	
	MJ million	£ million
Hotel restaurants	12.950	71.1
Other commercial restaurants	24.990	137.0
Non-commercial catering services	39.830	219.2

With moderate improvements in efficiency and rationalisation in the use of equipment, savings in excess of 20 per cent are achievable. Annually, this represents an energy saving of over 16.000 million MJ and a cost saving to the industry of over £87.8 million (1983 prices).



9

Food and Drink Service

1. Food service arrangements

1.01 Determinants

Food service arrangements have a major influence on the circulation, planning and design of restaurants (see Chapter 4, section 2.01).

In deciding on the most appropriate method and style of service, the same considerations apply as those for planning menus (Chapter 7, section 5.02) and production (Chapter 8, section 1.02).

The determining factors are normally:

- *company policy*: corporate objectives and mode of operation,
- *target markets*: types of customers, circumstances affecting choice,
- *pattern of demand*: rates of arrivals, peak numbers, seat turnover (see section 1.02),
- *main limitations*: in space, capital or operating budgets.

If the market catchment is large, more than one type of restaurant facility may be provided offering different styles of service, for example:

- *hotel restaurants*: main restaurant, coffee shop, grill-room,
- *employee services*: main cafeteria, executive dining room, snack bar.

1.02 Analysis

Flow patterns to determine optimum rates of service for any particular situation can be simulated by computer programming (see Chapter 4, section 2.03).

This is particularly important in planning counter and cafeteria service, in which the rate of throughput is often critical, but can also be applied to other restaurants and bars.

Inputs	Used progressively to calculate
Customer grouping	Table sizes, optimum seating arrangements
Arrival patterns	Demands on service, effects of delays, queues
Rates of service	Design of counter, staffing, rates of production
Time taken per meal	Restaurant capacity, seat turnover
Overall meal period	Numbers of customers, revenue generated

1.03 Food service methods

There are four main methods of meal service:

- waited service at the table,
- self-service selection from a counter or display,
- counter service with meals consumed at, or served over, the counter,

- assembled meal service.

Each method may have several variants and may be combined; for example, counter meals may be also served at the table to extend the seating area.

2. Self-service facilities

2.01 Self-service

Self-service facilities can be grouped into five main types, depending on the way food is presented and selected.

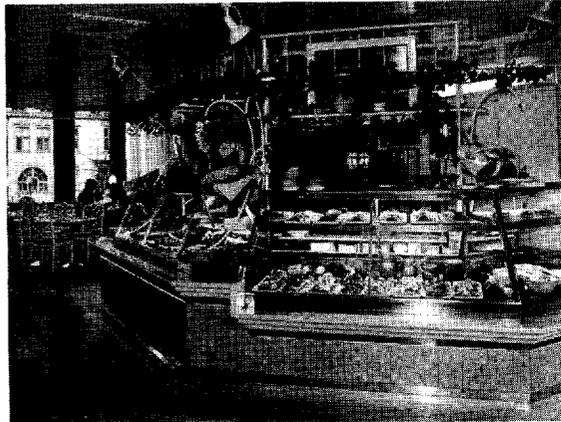
Cafeteria system	Consisting of a number of units arranged in series to form a continuous counter along which the customer travels with a tray to select various items of the meal which are paid for at the end of the counter line
Free-flow system	Based on several separate counters which are approached in parallel, the customer using any one of the counters which is free to obtain the particular meal required. Payment is made on leaving the area at any one of several cash desks
Mechanical systems	May be part of the counter service or form an independent unit. Mechanical systems include rotary turntables which slowly rotate to convey a selection of meal items to the serving area
Automatic systems	Comprise vending machines which are operated by coin or key to provide hot or cold meals or various kinds of beverages. Vending machines may also be used to augment a counter service or be arranged as a self-sufficient unit
Self-help systems	Allow the customer to select both the items of food and quantities from an open display of food. Self-help counters (e.g. salad bars) may supplement other service arrangements

Examples of self-help service:

- buffet service from displayed trays or dishes,
- chef's table for self or assisted carving of a selection of joints,
- family service with a variety of dishes placed on the table or sidetable for self service. Food may also be heated in containers on the table. Many of the traditional Oriental and Asian meals are based on family service.

2.02 Cafeteria systems

The simplest arrangement is a single, straight counter with sections for cold service, hot dishes,



Le Buffet, Helsinki

A gourmet restaurant situated in a new shopping centre in Helsinki, specialising in local as well as international dishes. The refrigerated display shows a smörgåsbord selection.

Equipment: METOS Instrumentarium

sweets and beverages. Variations include:
 — counters curved, extended round internal corners or outside a service island,
 — duplicated lines, in parallel, converging or diverging in direction,
 — specialist sections at one end of the line (with by-passing) for grills, salads or snacks,
 — duplicated cash desks or other systems for payment.

2.03 Position

Cafeteria layouts require careful planning to avoid confusion, congestion or difficulties of servicing.

<i>Key requirements</i>	
From entrance	Counter visible (merchandising) with direct approach route
From kitchen	Direct access to food production area (pass-through holding units)
Servicing	Planned circulation for trolleys, food, returned dishes
Customer flow	Space for assembly, waiting, queueing
Menu and prices	Displayed at beginning and over each section
Trays	Strategic location of tray dispensing and collection points
Utensils, condiments	Specially designed stands, located away from the counter, with space for assembly and circulation
Seating areas	Grouped in zones between circulation routes to reduce disturbance

Counters may be partitioned from the kitchen or from the dining area to minimise disturbance. They may also be built into wall openings which can be closed off to allow multi-purpose use of the room.

2.04 Speed of service

The rate at which a customer can pass along a service counter is affected by the complexity of meals served, the design and layout of the counter and the speed with which the customer chooses his meal. A limited menu speeds up service but is prone to more serious hold-ups unless efficiently served.

Potential bottlenecks may arise from:

- menu selection – hesitancy in deciding choice,
- serving – areas where customers are unable to serve themselves.

<i>Average flow rates</i>	<i>Customers/minute</i>
Single-line flow, one cash desk with 2–3 choices/course:	
Staff feeding	8–9
Public cafeteria	6–7
With some by-passing and duplicated cash desks	10–14

2.05 Counter design

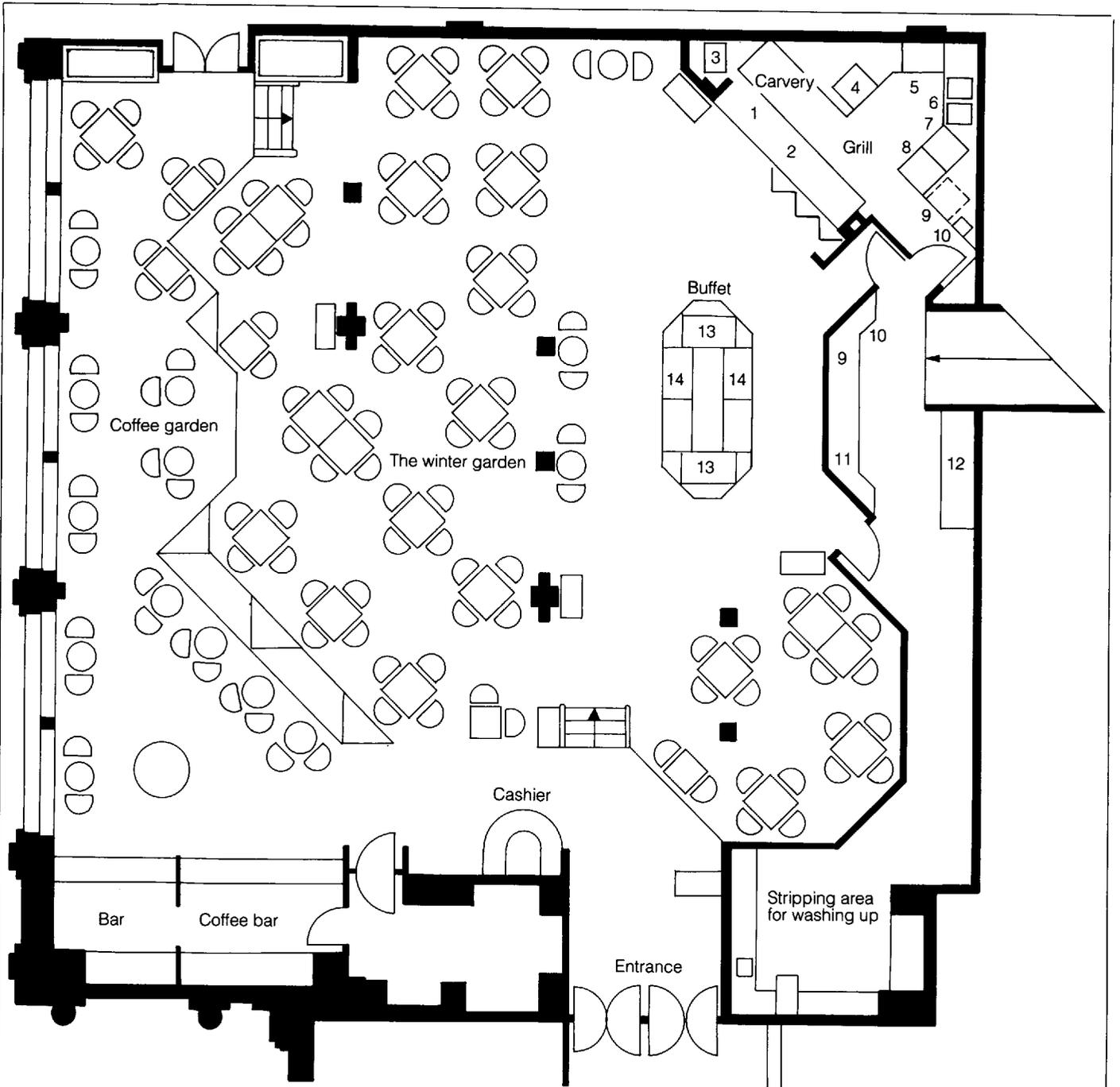
Counters are made up of modular sections joined together to form a line with a continuous tray slide. A straight counter is usually adopted for simplicity of layout and operation and to allow economy with standard counter sections and interchangeable units.

Length

Counters may be shaped to fit the area available but changes in direction must be no more than 45° or a gradual curve (to avoid tray binding, spillage). The length of counter depends on type of meals and variety of choice offered:

<i>Example</i>	<i>Typical length</i>	
	<i>m</i>	<i>ft</i>
School and institutional feeding	6.1	20
Staff feeding (2–3 choices)	9.2	30
Commercial cafeteria (wider range)	11.0	36

The trend in counter design is towards shorter counters supplemented by mobile units for self-selection (salads, health foods, sweets) or multiple counter arrangements.



Grill and carvery

- 1 4 no. carvery stands
- 2 2 hotplates
- 3 Microwave oven
- 4 Grill
- 5 Broiler
- 6 Double fryer
- 7 Griddle
- 8 Boiling table hob unit

- 9 Sink
- 10 Wash-hand basin
- 11 Milk dispense and coffee machine
- 12 Refrigerator

Buffet

- 13 Hot plates
- 14 Refrigerated displays

Pavilion Restaurant, Grosvenor House, London W1

The design of the new Pavilion Restaurant provides a grill bar-carvery for call-order items and an island buffet for self-service within an enchanting winter garden setting. There are separate bar and coffee bar units.

Food service planning: Trust House Forte Ltd
Architects: Peter Ednie and Partners

Depth

Overall depth	m	in.	Notes
Customer space (single file)	900	36	With guide rails funnelled in approach to cash desks
With by-passing (minimum)	1,200	48	
(preferable)	1,350	52	
Tray slide width	300	12	For 350 mm wide trays
Counter depth (average)	750	30	Uniform line
Serving space (minimum)	750	30	For replenishment access
(preferable)	1,150	45	
Back-bar units (if installed)	750	30	

Counter height

Standard height 900 mm (36 in.). Display cabinets and shelving may be arranged in tiers within

convenient reach. Sneeze guard screens must be fitted.

Clearance

150 mm (6 in.) clear of floor to facilitate cleaning under the units.

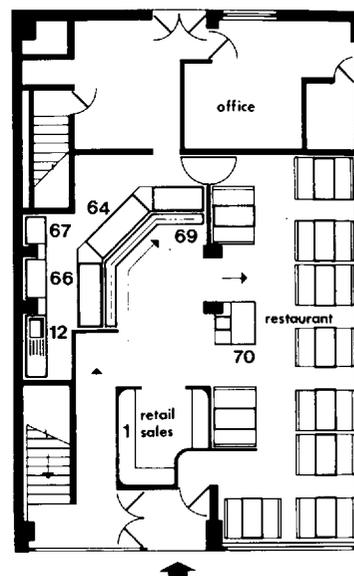
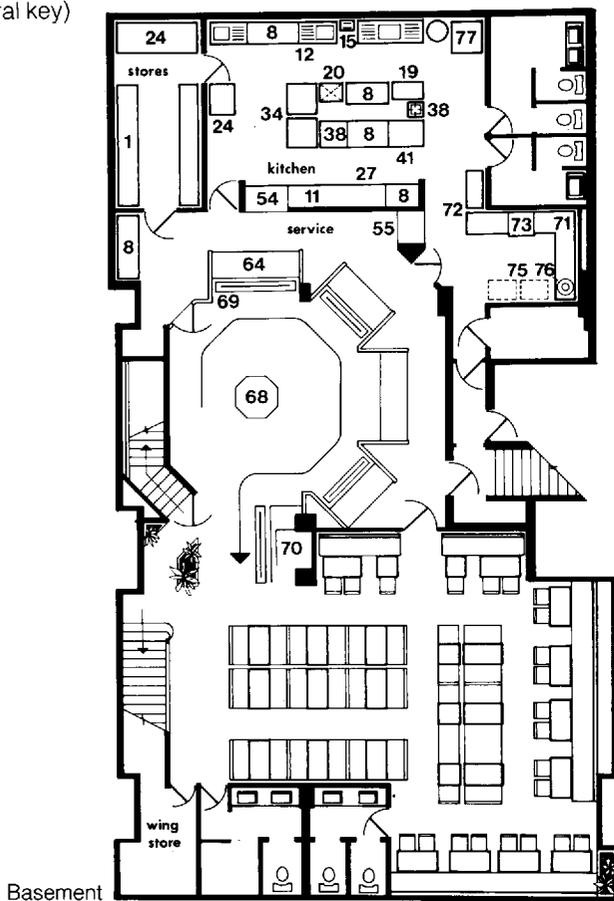
Units should have height adjustable feet or castors.

Units such as tray stands, plate lowerators, ice-cream conservators, etc, which need frequent replacement, must be mobile.

Tray slides design

- solid shelves are more difficult to clean and offer greater variation in frictional resistance,
- circular rail types more liable to cause tilting and spillage,
- the joints and rim of the counter must not obstruct sliding,
- the slide must be non-flexing, strong and firmly fixed,
- a width of 300 mm (12 in.) is typical for a 350 mm (14 in.) tray.

(see general key)



Ground floor

Anna's Kitchen. Equipment by Oliver Toms Ltd. Entrance and ground floor of a small restaurant with separate self-service counters for hot meals, cold dishes, coffee and drinks arranged octagonally around the circulation area.

2.06 Heating and refrigeration

Counter units may be:

- unheated, with under counter cupboards, shelves or equipment,
- heated: hot cupboards at 76–88°C (170–190°F),
- refrigerated: 3–5°C (37–41°F) with compressor/condenser unit.

The counter top may also have a:

- plain top as a serving or working surface,
- bain-marie – with recessed containers heated to at least 74°C (165°F) (container sizes to gastronorm dimensions),
- chilled dole plate, recessed to hold ice or cold food,
- raised display shelves, heated, unheated or chilled.

Where ice cream is served a conservator with the temperature kept below –1.7°C (29°F) is required, to meet legal standards.

Food transferred from the kitchen may be brought in mobile trolleys for positioning in line, in bain-marie containers or passed through holding units (heated or refrigerated), between the kitchen and servery.

2.07 Lighting and ventilation

High local levels of illumination are necessary for merchandising and functional needs. In the servery area generally a minimum of 400 lux (40 lumens/ft²) should be provided, increasing to 600 lux (55–66 lumens/ft²) locally over the counter, menu displays and cash desk.

The colour rendering of 'natural' light plays an important part in enhancing the display of food. Over hot food counters, decorative infra-red lamps may be fitted to combine radiant heat with illumination. Lamps and reflected light must be screened to avoid glare.

Ventilation of the servery is necessary to remove:

- steam and fumes from food being served,
- heat from hot cupboards, bain-marie and equipment and the heat given off by people crowded into a small area.

If the servery is open to the kitchen, the extraction rates in the latter may provide an adequate air flow over the counters but some form of balancing with plenum inlets over the servery is desirable. A servery which is separated requires local extraction. To regulate and balance flows directional plenum air inlets may be provided in the ceiling or canopy perimeter.

2.08 Sequence and display of food

In deciding the best positions for various kinds of food along the counter consideration must be given to the requirements tabulated on p.236.

Self-service counters

Standard counter units are 900, 1,200 or 1,500 mm long (36, 48 or 60 in.) but can be fabricated to customer dimensions.

Counter widths are normally 700 or 750 mm (27 or 30 in.) and the standard heights are 850 mm (33½ in.) with alternatives 875 and 825 mm. Foot adjustment is about 30 mm.

Tops are normally 1.6 mm stainless steel and side panels 1.2 mm stainless steel with a choice of decorative front and side panel. Facings of laminate and tile may be used.

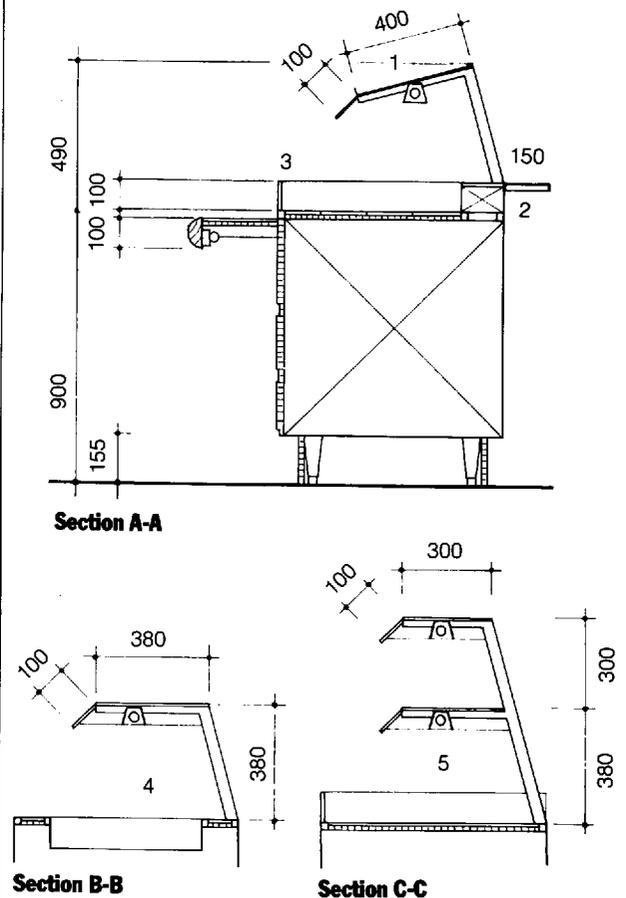
Shelves are usually of toughened glass, clear or tinted, with angled sneeze screens.

Bases may be refrigerated (a) with integral compressors (b) and electrical housing (c). Heated cupboards (d) are also used and may be fitted with plate lowerators (e). Ambient bases may be cupboards, open with cup baskets (f) or with shelves (g). Space can be provided for drainage buckets or under-counter boilers.

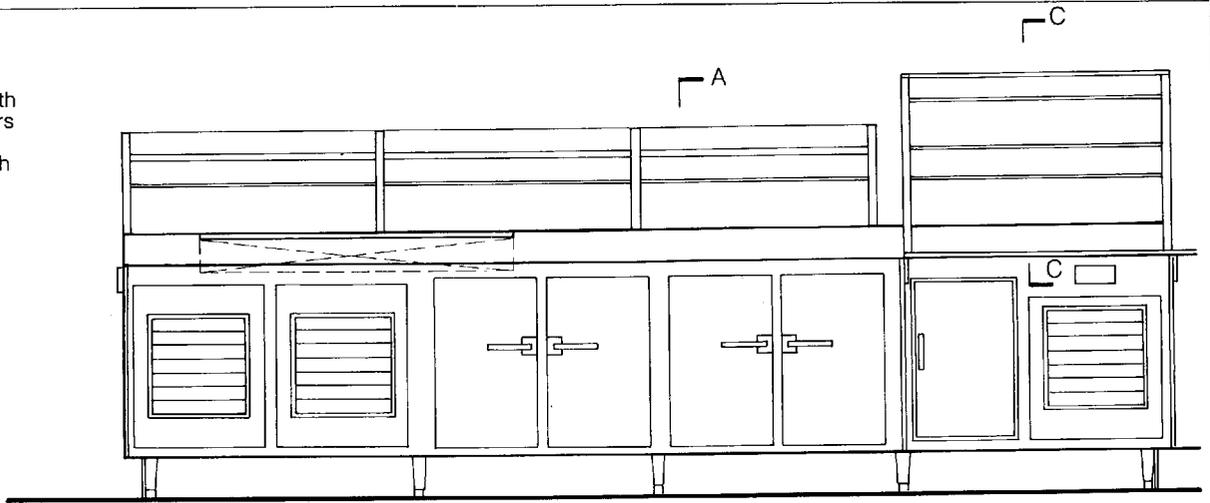
Tops may be plain, bain-marie, chill well or frost top fittings. All the trays and inserts must be to gastronorm dimensions to allow interchange.

Over-shelf units may be front or rear mounted for self or assisted service and should be fitted with sneeze screens. The shelf may have fluorescent or quartz heating lamps.

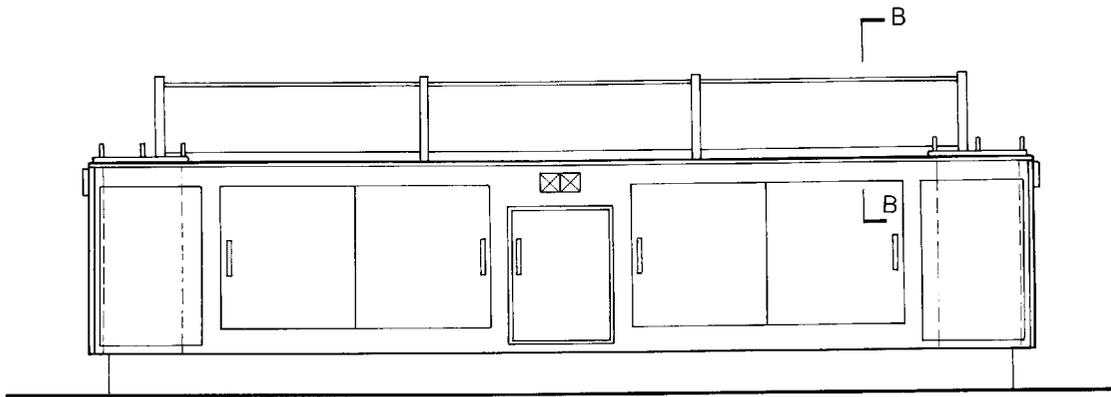
The sections show typical counter dimensions and are based on the installation for the Barbican Arts Centre planned by Tricon Foodservice Consultants.



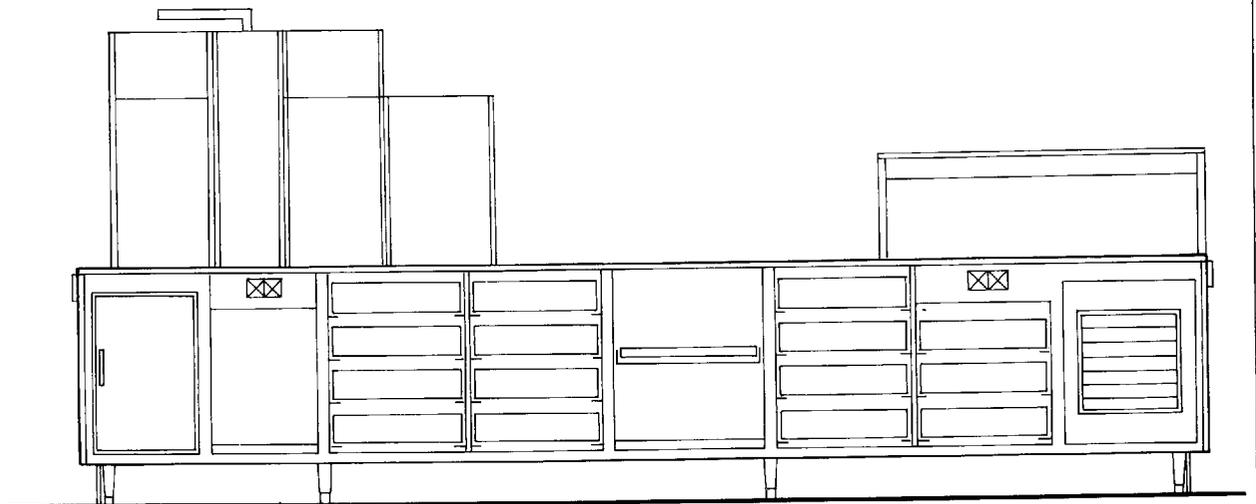
- Key**
- 1 Sneeze Guard
 - 2 Fan cooler
 - 3 Tiled tray slide with inset nylon runners
 - 4 Refrigeration well
 - 5 2 Tier shelves with fluorescent tubes



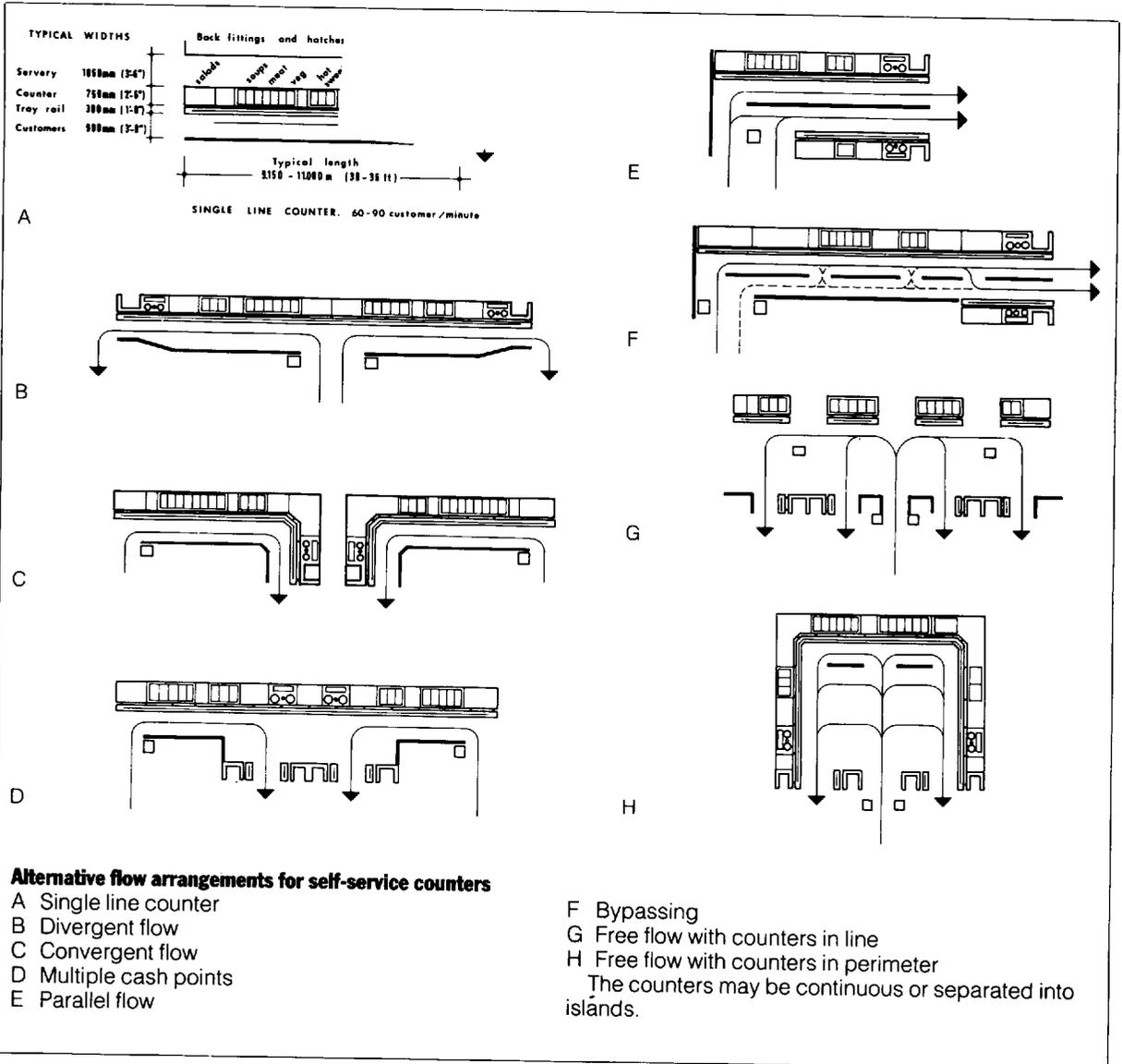
(b) (a) (a) (c)



(e) (d) (d) (e)

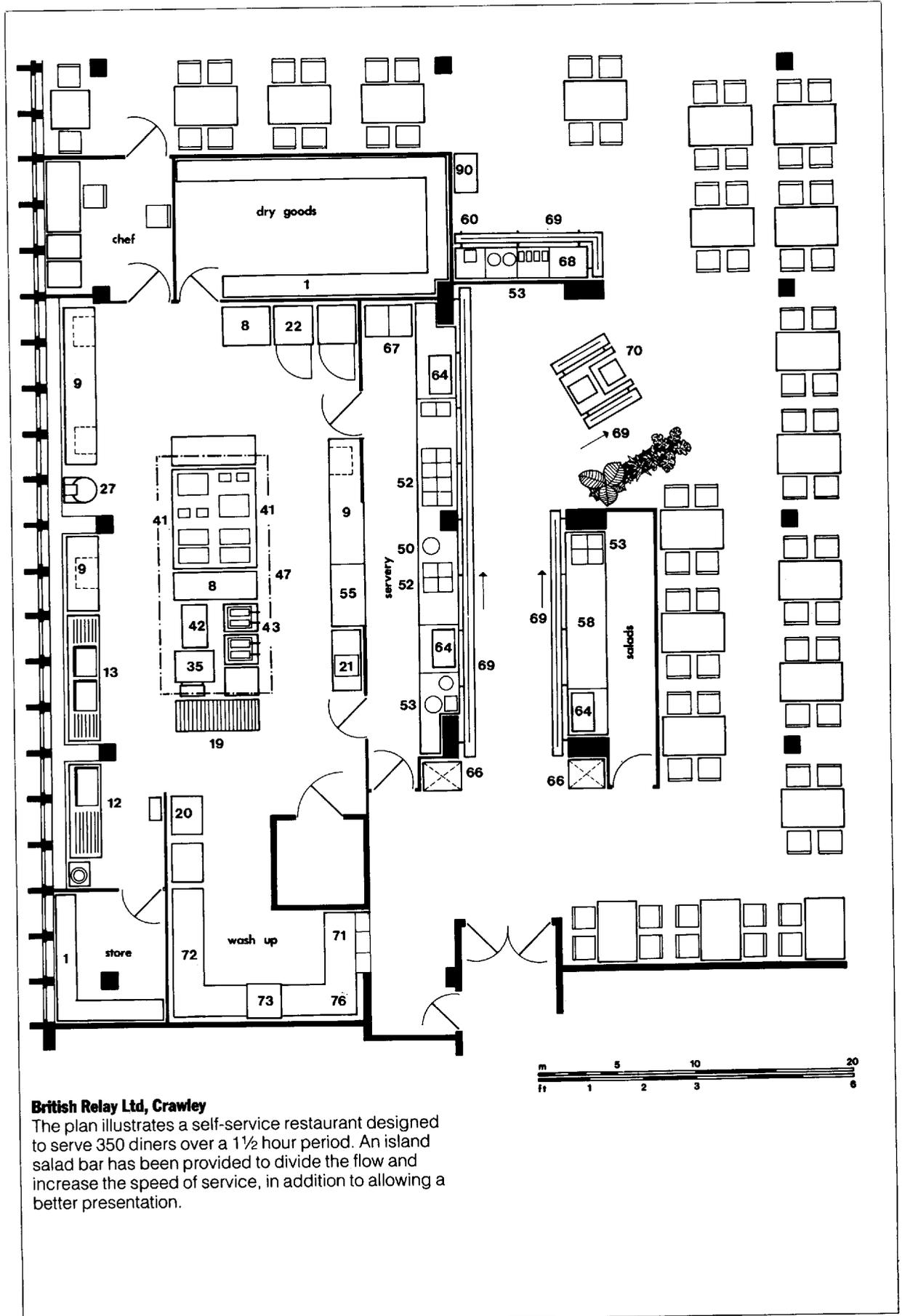


(f) (g) (f) (c)



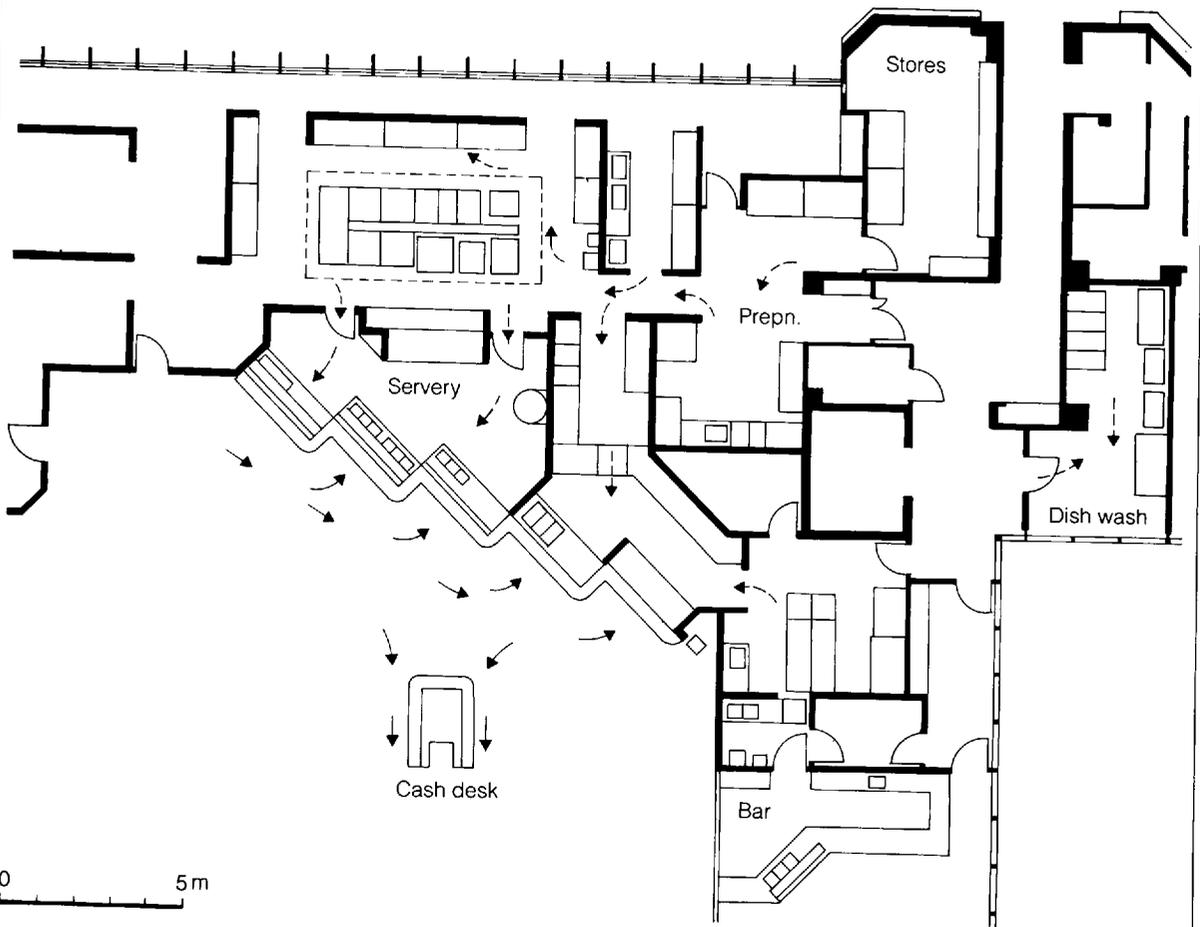
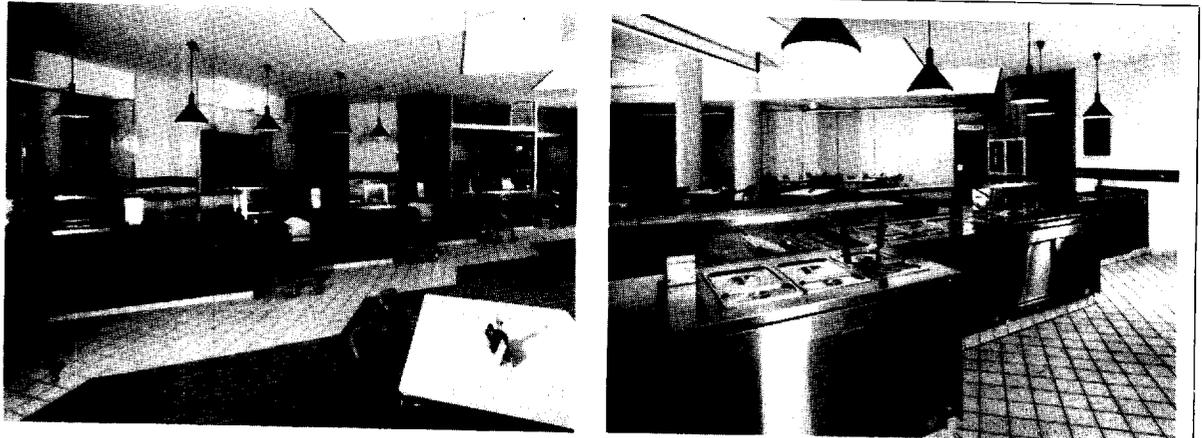
Requirement	Design provision
Clean tray collection	Specially designed stand at the start of the counter or well clear of the line if by-passing is encouraged
Food collection	Usual sequence: cold service salads, cold meats, etc (ready assembled). Bread, rolls, butter, sandwiches. Hot food service – soup, main dish, gravy, vegetables. Hot puddings. Cold sweets, pastries, ices. Tea, coffee, milk and other beverages. Cashier
Impulse buying	Presentation of cold service meals, sandwiches, etc. Photographs of meals
Hot food and beverages	Near end of counter line so that food does not get cold before consumption and to concentrate serving staff (flexibility)

	Sections	Options
Separate counters (depending on volume of sales)	Cold foods, salads Short order meals Snacks, coffee, etc	Satellite units, buffet displays. With local back-bar equipment. Self-contained area, extended use
Main delays	Cashier desk Hot section Beverages	May be duplicated at peak times. By-passing or alternative cold counter provided. Alternative vending machines or separate coffee/snack-bar counter



British Relay Ltd, Crawley

The plan illustrates a self-service restaurant designed to serve 350 diners over a 1½ hour period. An island salad bar has been provided to divide the flow and increase the speed of service, in addition to allowing a better presentation.



Metropolitan Police, Administrative Centre, London SW1

The servery for the six-storey administrative centre with 1,500 employees is designed on the free-flow principle with three echelon serving counters. The self-service restaurant seats 150 and there is a separate restaurant with waited service and a pub-type food bar.

Equipment suppliers: G. F. E. Bartlett & Son Ltd
 Clients: Crown Estates Commissioners

2.09 From the counter to the dining area

To reduce risk of congestion or accidents:

- exit routes from the counter must not be obstructed, particularly by low objects,
- stands for condiments, cutlery, etc, must be positioned to one side with clear access, and be fitted with tray rests,

- there must be no steps, changes in level or any changes to the surface of the floor which will affect foothold,
- sufficient width should be allowed for passing but not to encourage crossing over,
- assistance may be provided to older customers in carrying trays from cashier to table.

British Home Stores Restaurants

Responding to the escalating competition in high street shopping, BHS has embarked on a strategy of refurbishing its 69 stores with the object of creating a distinctive identity for the 1990s.

BHS have a long tradition of running successful high street restaurants, from the small café-style coffee bars of the 1940s and 1950s to the large 200–500 seat cafeteria of the 1960s and 1970s. The new restaurants reflect the shift in market positioning and are designed in three styles:

● **country table**, for small to medium stores, with an area of 280–460 m² (3–5,000 ft²) and seat 100–150. The servery is in-line and provides a varied menu, individually priced dishes and snacks with the emphasis on quality. No fried food is offered and labour is minimal.

● **patio restaurants** are being developed in the larger stores occupying 550–930 m² (6–10,000 ft²) and seating 150–300. The restaurants with over 200 seats have a free-flow food servery with self-help salad and beverage bars.

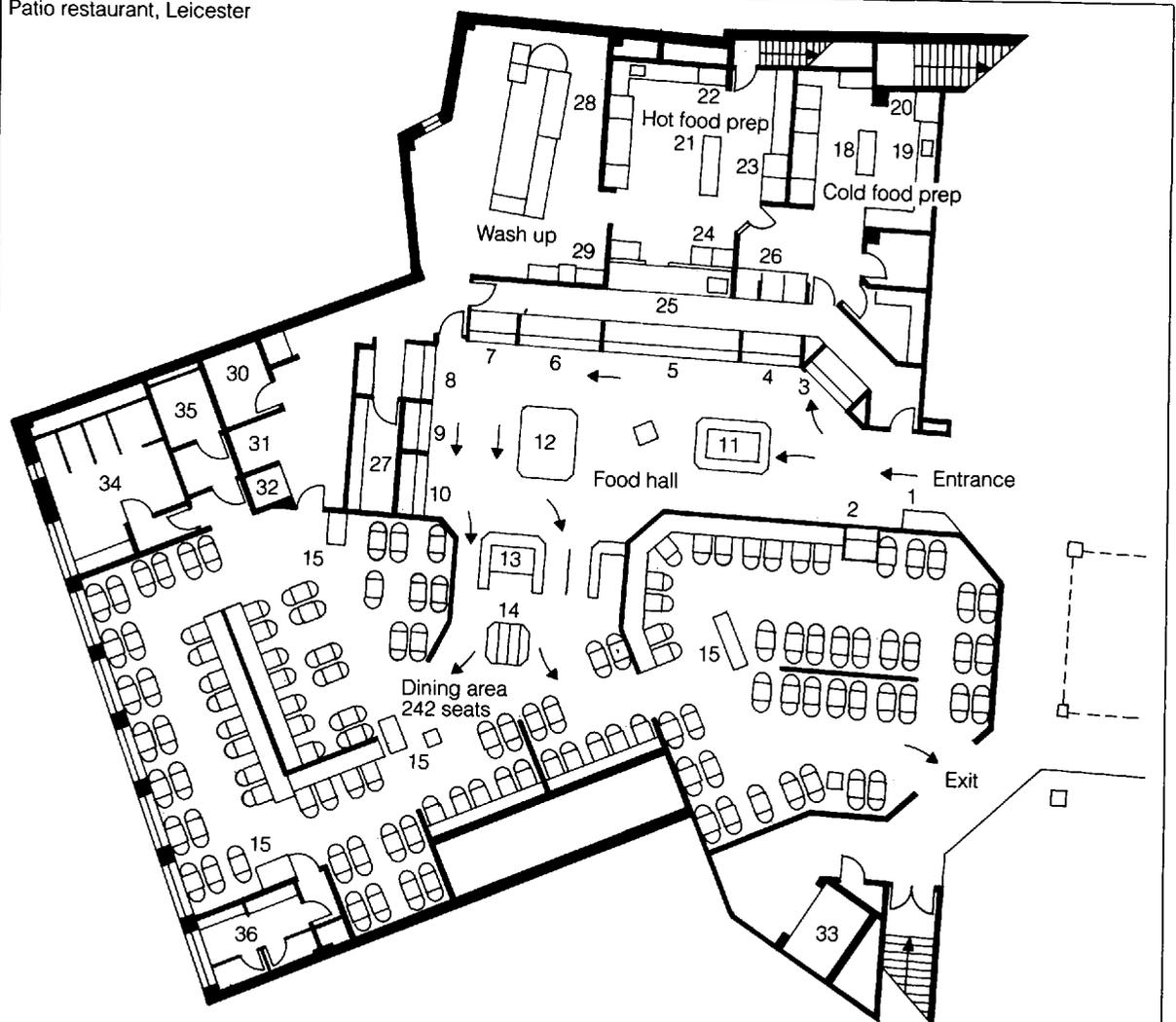
● **coffee shops**, seating up to 50, located in prime ground-floor positions, used alone or to support the main restaurants.

Patio Restaurant, Hull, free-flow servery (a) and seating areas (b); Country Table, in-line counter (c), and cashier point (d) Coffee Shop, Leicester (e).

Architects: British Home Stores Architects Department
Architecture interior and graphics: McColl
Clients: BHS Stores Development



Patio restaurant, Leicester



Customer circulation

Servery

- 1 Tray pick-up point
- 2 High chairs
- 3 Cold sweets counters
- 4 Cold food counters
- 5 Hot food counters
- 6 Fish bar
- 7 Ambient temperature counter
- 8 Ice cream counter

- 9 Wine/beer counter
- 10 Cold drinks counter
- 11 Salad bar
- 12 Hot beverages counters
- 13 Cash points (3)
- 14 Cutlery pick-up counter
- 15 Tray clearing points

Preparation

- 16 Day store
- 17 Office

- 18 Cold preparation area with refrigerated storage
- 19 Benching with fitted shelves and sink unit
- 20 Convection oven...
- 21 Hot food preparation area with refrigerated storage, mixer and benching with fitted shelves and tray racks

- 22 Boiling top with adjacent preparation bench
- 23 Convection steamer and convection oven with adjacent benching
- 24 Fryers with extraction canopy and shelving
- 25 Back-bar cooking equipment with grill/salamanders, toasters and microwave oven

- 26 Heated and refrigerated pass-through units
- 27 Wine and beer store
- 28 Dishwashing machine with stripping bench and conveyors
- 29 Potwash machine with racks

Ancillary areas

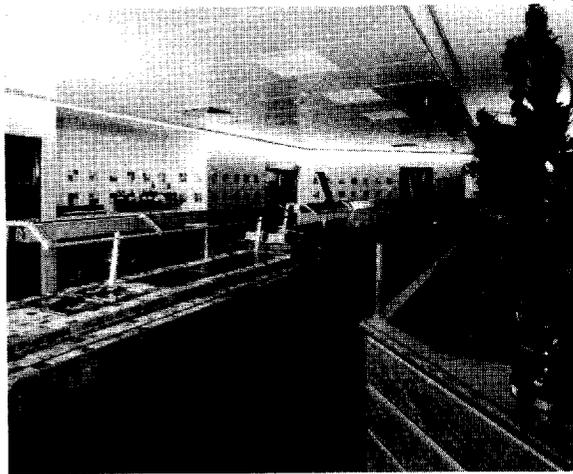
- 30 Electrical switch room
- 31 Refuse area
- 32 Cleaner's store
- 33 Lift
- 34 Toilets - female
- 35 Toilets - for disabled
- 36 Toilets - male



(b)



(b)



(c)

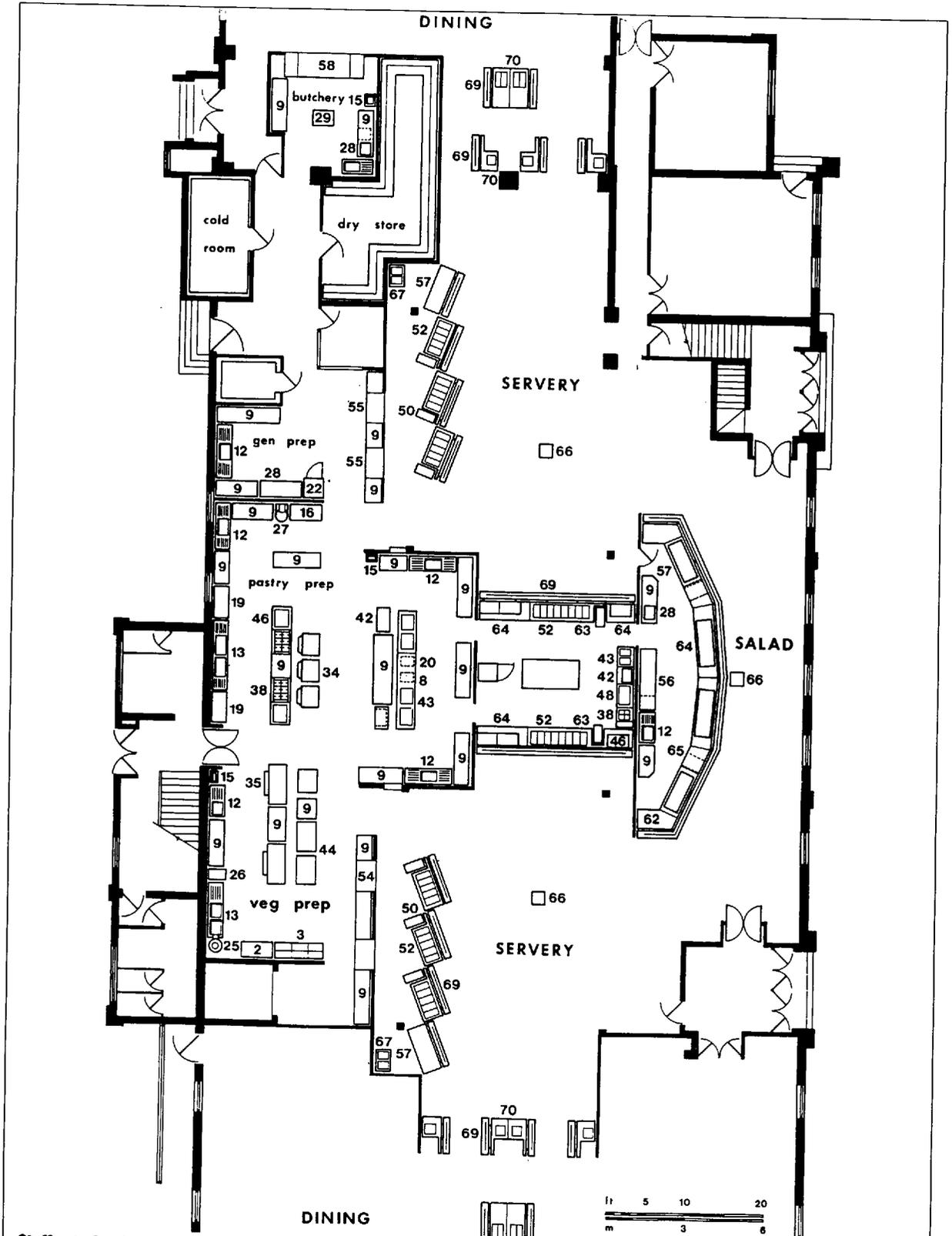


(e)



(a)

British Home Stores



Staff catering facilities, Plessey, Liverpool

The arrangement of the kitchen and servery is designed to provide up to 4,000 meals within a period of 2½ hours.

Equipment: Oliver Toms Ltd

2.10 Free-flow systems

The main disadvantage of the cafeteria arrangement is the way in which customers have to line up along the whole length of the counter. Any delay in service is liable to cause hold-ups and queues to form.

The efficiency of a continuous counter can be improved by by-passing facilities and this principle is developed in the free-flow system which

has several counters each serving different meals, such as hot foods, salads, sandwiches, desserts and beverages.

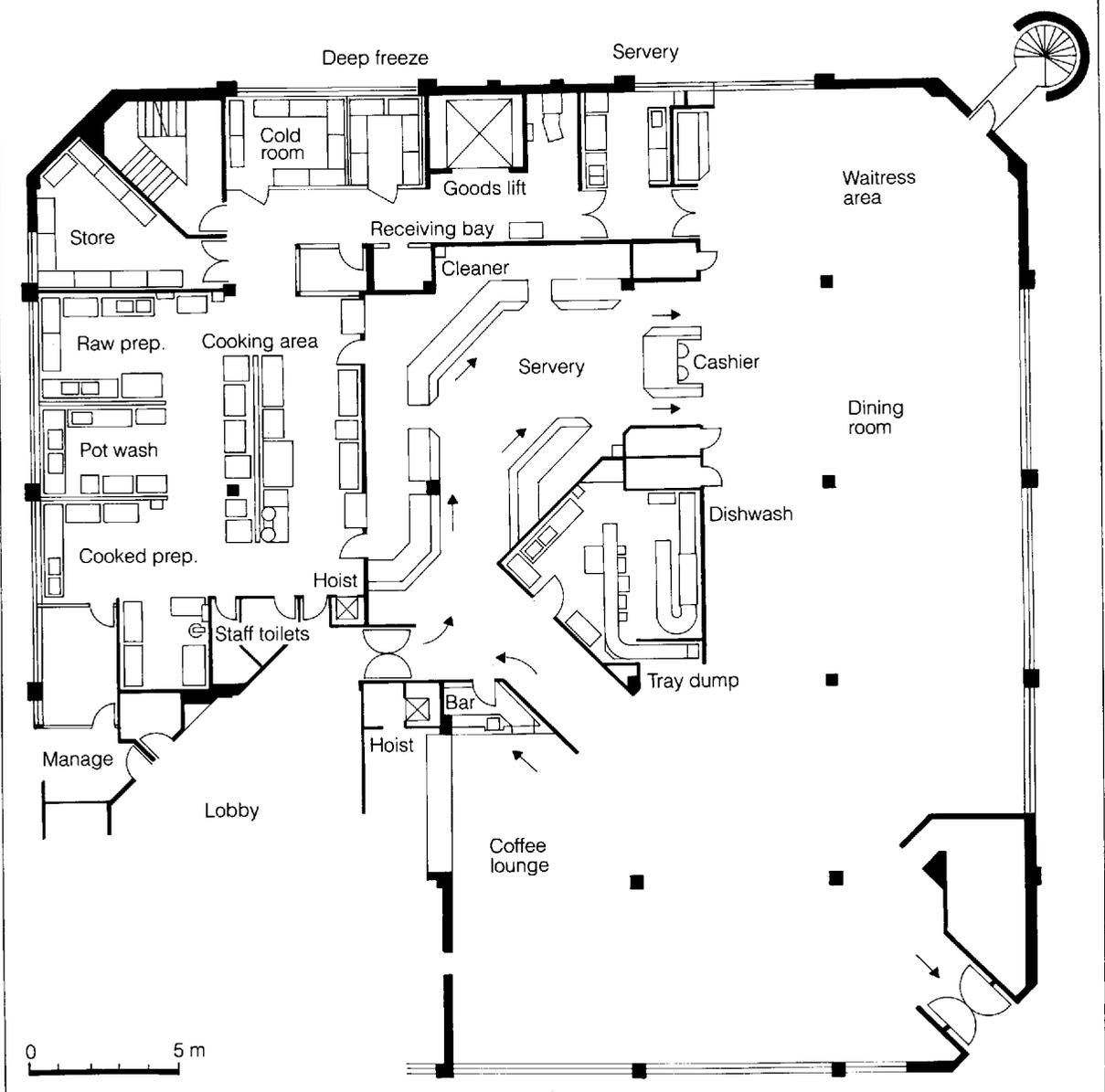
- Among the advantages of this arrangement are:
- avoidance of long queues at counters, increased speed of service,
 - separation of salads, snacks and other self-service items,
 - flexibility in the use of counters, depending on the demand for particular meals,

T.S.B. Trust Co. Ltd

Food production and service installed on the first floor, within the structured constraints of a new building (1986). The servery is based on the food court concept with separate entrance and exit. To avoid cross flow, the dishwashing area and tray dump have been placed centrally. Designed initially for 300 but with scope for extension to 500, the capital cost of the

catering equipment, servery and lighting was £300,000. A separate coffee lounge is provided and a directors' dining room on another floor is supplied by hoist.

Catering design: Tricon Foodservice Consultant
 Clients: T.S.B. Trust Co. Ltd



- outside peak periods fewer counters can be used,
- multiple cashier points can be provided, with similar flexibility in use.

This system is particularly suitable for large scale employee catering for over 600 meals per day but can also be adapted to commercial restaurants providing self-service in airports, motorway services, departmental stores and other locations with high customer concentrations.

The area required for serving, say 800–1,000 customers during the main meal period, is typically in the order of 186 m² (2,000 ft²).

2.11 Planning

Food service counters may be positioned in an antespace or food service hall leading directly to the dining area. Although there are many variations, depending on the space available, two main layouts are typical:

- hollow square or U-shape with counters around three sides of the service area. This is mainly used in commercial restaurants where there is a steady flow of customers,
- echelon, or angled arrangement of counters, to serve large concentrations of customers, as in employee catering.

Essential requirements:

- clear signs at the entrance and over each counter,
- clear routing of customers to avoid cross traffic and congestion,
- direct access from the food production area to allow for staff and trolley circulation,
- counters for salads, plated cold dishes, pastries, sandwiches, etc, positioned to one side of the main flow,
- beverage counters located adjacent to the servery exit to limit carrying time,
- stands for trays and cutlery may be provided at each counter or at the entrance and exit to the servery. A separate stand for cutlery, condiments, napkins, etc, with a tray rest, should be located adjacent to the dining area,
- a separate call-order counter may be provided with back-bar cooking equipment (located to one side of the main service area).

2.12 Mechanical systems

The carousel consists of rotating shelves on which food and drink are displayed for self-service. The unit, about 2 m in diameter, is positioned between the food production area (for shelf replenishment) and the dining room. Each rotation takes about one minute and the throughput of customers is about 8–10 per minute, higher than in-line cafeteria counters.

The overall area required for food service is about 16–20 m² with separate beverage, tray and

cutlery stands. Some congestion may arise from delays in food selection. Carousel and other rotary systems are more suitable for customers familiar with the system. They may be used:

- as a self-contained service point,
- for dispensing hot food, together with separate counters for cold items,
- to collect used dishes for return to the dishwash area.

2.13 Automatic vending

As a means of serving hot and cold beverages, pre-packed confectionery and snacks and even full meals, automatic vending has a number of advantages over other methods:

- food and beverages can be made available at a large number of places without limitations on time of service, allowing convenient access and flexibility in meal breaks,
- vending machines may be purchased by the owners of the premises or provided on contract by a vending company,
- individual service is relatively quick – an average of 12 seconds for a beverage, 5 seconds for a snack meal,
- control is provided with precisely measured quantities and correct charges. Most modern machines incorporate sophisticated protection against damage, vandalism and misuse,
- minimum labour is required for routine cleaning and servicing (about 20–30 minutes/day). Technical services are supplied through maintenance or contracting agreements,
- machines can be refrigerated to keep food or drinks cold. Research has progressively improved the quality of products such as instantly brewed beverages,
- meals can be selected and heated to individual order by microwave oven,
- the permanent display and availability of snacks and beverages tends to generate greater demand through impulse buying,
- machine designs can be incorporated into a wide variety of schemes.

Vending machines cannot be regarded as a substitute for conventional methods of food service on a large scale because of the number of machines necessary and the high costs involved.

2.14 Practical applications

The main areas in which automatic vending has become widely used may be summarised as follows:

<i>Services</i>	<i>Applications</i>
Travellers, shift workers, night workers, hotels	Providing a meals service at times when the main catering services are closed

Employees, recreational facilities	Supplementing the main restaurants and cafeterias, near places of work or leisure
Restaurants, cafeterias	Reducing service delays with self-help beverage vending machines
Automated vending bars	Where warranted as alternative to continuous personal service. The installation may include a refrigerated store room and kitchen facilities for preparing sandwiches and snacks

2.15 Capacity

Capacity requirements for machines are usually determined by the numbers of users and intervals between filling the machines.

The numbers of vending machines are calculated from:

- location requirements,
- the numbers of meals or beverages required to be sold within a short period, say 10 minutes, comparable to self-service from a counter.

The following table indicates the number of machines required over 10 minutes to provide 50–400 meals:

<i>Machine service</i>	<i>50</i>	<i>100</i>	<i>200</i>	<i>400</i>
	<i>Number of machines required</i>			
Hot drinks	1	3	4	6
Cold drinks	1	1	2	2
Hot main meals	3	5	10	20
Refrigerated meals	3	4	6	8
Unheated sweets	1	2	4	8
Snacks, sandwiches	1	2	3	6

2.16 Selection of machines

In selecting a vending machine it is necessary to take into account two main areas of requirements. Firstly, the machine must meet the specific needs of the vending operation in terms of the type of products dispensed; range of choice; mode of operation; facilities for refrigerating and heating, etc. In addition, all machines should comply with more general requirements, such as:

- simplicity of operation,
- reliability in use,
- accuracy in dispensing,
- ease of servicing and refilling,
- hygienic construction and operation,
- appearance and durability.

2.17 Services

Service connections appropriate to the type of machine will need to be provided (with isolating switches or valves).

<i>Services</i>	<i>Main requirements</i>
Electricity supply	Single-phase supply usually adequate. Required for illumination, power, water heating (beverage vending), microwave heating, refrigeration (chilling)
Water supply	Mains supply usually connected to beverage machines (pressure specified). In others a storage reservoir may be provided. Water supply in close vicinity is essential, including hot water for cleaning
Drainage	Storage receptacle provided in equipment with flexible hose for drainage. In multiple installations a drainage gully is preferable to facilitate washing down
Refrigeration	Usually an integral part of many machines (perishable foods, chilled beverages). Provision should be made for ventilation through the housing cabinet
Refuse	Bins with self-closing flaps and leak-proof inner linings should be provided for disposables and waste food

2.18 Surroundings

The area in which vending units are sited is usually subject to intense traffic, spillage, soiling and damage (including vandalism). The adjacent walls and floor must be impervious and easily cleaned. Lining materials include decorative ceramics and thermoplastic laminates. Flooring may be tiled (ceramic, vinyl or composition).

A high level of illumination – 600 lux (50 lumens/ft²) – is essential to enable the contents and instructions to be easily seen, to reduce vandalism and to improve merchandising.

2.19 Self-help facilities

Facilities to enable customers to help themselves to a selection of dishes include:

- meals provided as inclusive charge: hotel breakfasts and buffets,
- speciality meals: chef's table carveries, barbecues, salad bars, desserts,
- low cost or portional items,
- receptions, functions, social events: buffets, clubs, conventions (see section 6),
- family service: ethnic restaurants, private parties.

The food may be displayed on a refreshment bar, buffet table, side table or speciality designed equipment (for carving, serving hot food, etc). For control and increased throughput, self-help may be limited to particular low cost or portioned items or combined with assisted service (carving,

3. Counter service

Developments in counter service range from over-the-counter fast-food sales to coffee and snack bars, pub-counter meals and more sophisticated butlery bar service. Counter service is also used for Japanese sushi and satsumi bars.

Advantages include:

- social contact with other customers and servers,
- visual presentation of food and service style (showmanship),
- separation of service staff and customers (speed and efficiency of working).

In counter seating, stools or seats are normally at 600 mm centres (24 in.) reducing to a minimum of 550 mm (22 in.) in snack bars. Counter seating requires about 1.8 m²/seat (18 ft²) and may be increased by

- extending the counters into loops,
- supplementing with alternative table seating.

Counters usually have an upper eating surface and a lower preparation area, (with sink). Typical dimensions are given in Chapter 4, section 4.05.

4. Table service

Waited service at the table has a number of advantages:

- space economy, giving higher seating densities,
- flexibility in style of service and degree of formality,
- customer staff contact (assistance, sales promotion),
- customer status enhancement.

Main styles of service include:

Type of service	Planning requirements	Main uses												
<p>Gueridon (or French service)</p> <p>Side table or trolley placed beside customer's table on which dishes are individually prepared, filleted, flambée, carved, etc.</p> <p>Requires a <i>chef de rang</i> and <i>commis de rang</i> to serve an average 10–12 customers</p>	<p>Space required for service and circulation (fewer tables). Special trolleys or portable equipment needed with high quality table settings. Extensive staff training</p>	<p>Gourmet meals, house specialities, high-class à la carte restaurants, night clubs</p>												
	<table border="1"> <thead> <tr> <th>Typical</th> <th colspan="2">Space/seat</th> </tr> <tr> <td></td> <th>m²</th> <th>ft²</th> </tr> </thead> <tbody> <tr> <td>Tables for 2</td> <td>2.2</td> <td>24</td> </tr> <tr> <td>Tables for 4</td> <td>1.9</td> <td>20</td> </tr> </tbody> </table>	Typical	Space/seat			m ²	ft ²	Tables for 2	2.2	24	Tables for 4	1.9	20	
Typical	Space/seat													
	m ²	ft ²												
Tables for 2	2.2	24												
Tables for 4	1.9	20												
<p>Silver service</p> <p>Food served from flats or dishes by waiting staff (English-style)</p> <p>Dishes passed round for self-help (French-style)</p>	<p>Sideboards and extra equipment necessary for serving, plate warming, etc. Dishwashing increased. Food portioned in dishes. Limited to small groups</p>	<p>High-class restaurants. Parties, small functions</p>												
	<table border="1"> <thead> <tr> <th>Typical</th> <th colspan="2">Space/seat</th> </tr> <tr> <td></td> <th>m²</th> <th>ft²</th> </tr> </thead> <tbody> <tr> <td>Tables for 2</td> <td>2.0</td> <td>22</td> </tr> <tr> <td>Tables for 4</td> <td>1.7</td> <td>18</td> </tr> </tbody> </table>	Typical	Space/seat			m ²	ft ²	Tables for 2	2.0	22	Tables for 4	1.7	18	
Typical	Space/seat													
	m ²	ft ²												
Tables for 2	2.0	22												
Tables for 4	1.7	18												

5. Bar service

5.01 Types of bar service

Bars used for the serving of alcoholic and other beverages tend to be individual in character and design but can be grouped according to their use (see table 5.01).

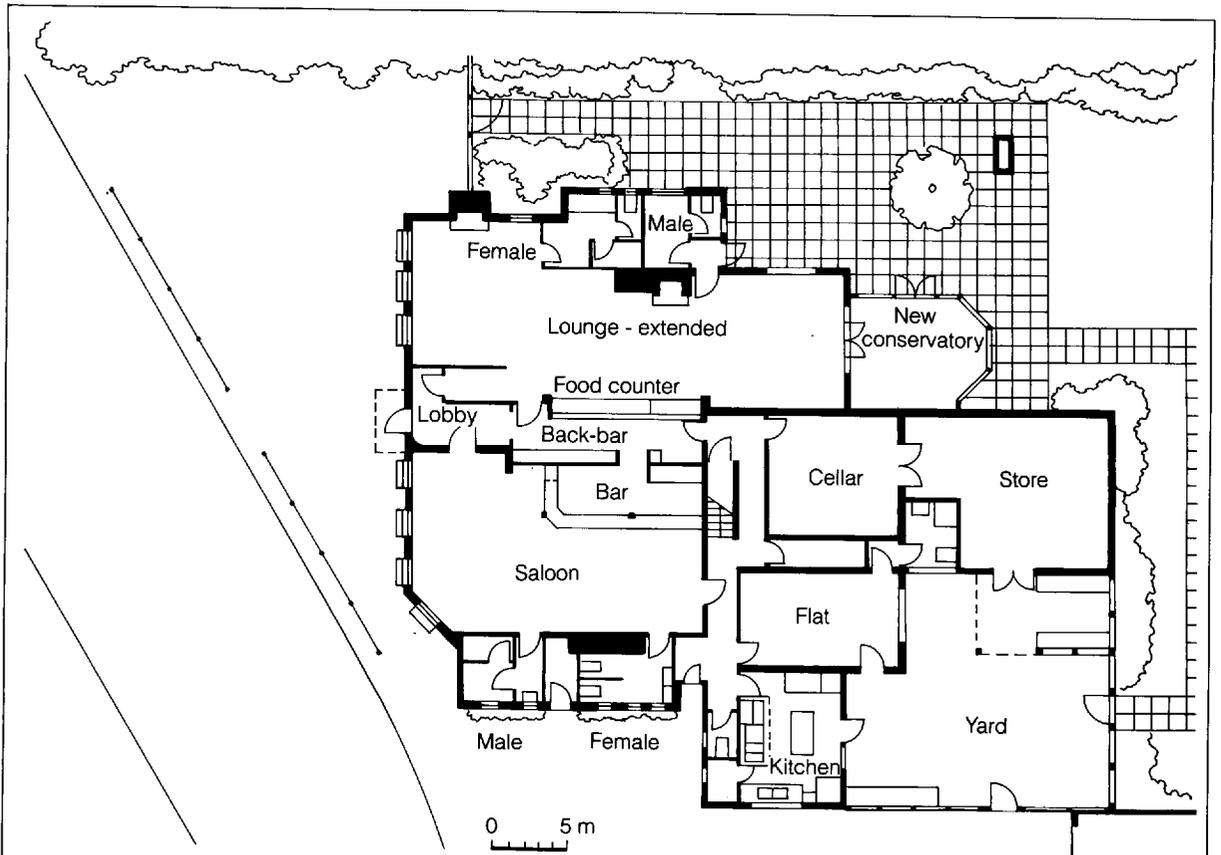
5.02 Bar design

A bar counter is often a focal point of attraction and therefore designed as a feature of interest. The design must also satisfy functional requirements and be ergonomically suitable for working within a restricted area. Key features are summarised in the table on p.249.

Semi-silver service Main items plated Vegetables, etc, served at table by waiting staff	Less equipment and fewer staff than above. Provides some individual choice, faster service	Medium-class restaurants
Plated service Food portioned and assembled on plates in kitchen or servery. Fast, informal service (American-style)	Less equipment, direct service from kitchen. Allows for flexibility, contemporary designs, fewer staff	Coffee shops, popular catering, single-course meals
	<i>Typical</i>	<i>Space/seat</i> <i>m²</i> <i>ft²</i>
	Tables for 2-4	1.9-1.3 20-14
Family service Dishes placed on table for self-help. Includes traditional ethnic meals (Chinese, Indian-style) fondue and speciality items	Involves traditional serving dishes and portable heating equipment (lamps, burners) as well as plate warmers	Ethnic and other speciality restaurants. Clubs and institutions
	<i>Typical</i>	<i>Space/seat</i> <i>m²</i> <i>ft²</i>
	Tables for 4	1.4 15
	Tables for 6	1.2 13

table 5.01

<i>Characteristics</i>	<i>Examples of use</i>	<i>Main features</i>
Intensive counter service	Service bars to meet concentrated demands in theatres, entertainment complexes, etc	Highly functional with multiple serving points. Crowding and queueing space
Limited counter space	Lounge and club bars with more seating than counter space	Complementary to the area and activities. Sociable design
Leisure and intimacy	Cocktail bars and featured customer bars in hotels, public houses, etc	Themed. Designed to attract interest. Fitted with bar seating
Indirect service	Dispense bars for waited service in restaurants and lounges.	Small counter areas, mainly functional with screened working and storage space
Food and drink service	Over-the-counter meal service in pubs, wine bars	Back-bar cooking equipment. Section of counter for food display and service
Portable counters	Temporary bars set up for functions, banquets, dances and outdoor catering	With under-counter storage and portable equipment



The George Public House, Slough

The George public house, owned by Imperial Inns & Taverns, was selected for a major refurbishment in order to generate more business, to create a more upmarket and less male orientated image without alienating the regular clientele. Because of the location and facilities it was targeted towards family and evening trade. The design approach was 'aspirational,' the intention being to offer the quality of environment which most people only see in magazines but would like to inhabit themselves. The result is reminiscent of a spacious, luxurious drawing room rather than a pub, an escape from the pressures of everyday life.

Interior designers: Murdock Design Associates
 Clients: Imperial Inns & Taverns

table 5.02

Features	Requirements																		
Linkages	Serving counters may extend between different bar areas. The servery must have access to storage and cellar areas (for supplies, pipelines, replenishments) (see Chapter 8, section 2.13)	Screens	Grilled mesh to isolate the bar or drink storage out of hours. May be over front or rear section of counter																
Location	The counter should be set back from the entrance and circulation routes (for visual attraction, control, reduction of congestion)	Counter seating	Fixed swivel seats or stable stools may be provided at 600 mm (24 in.) centres. The counter top may project 200 mm (8 in.) to provide knee space. Stool height: 750 mm (30 in.) for standing bar, with a foot rail, usually brass, 38–50 mm diameter, or covered step																
Counters	Bar serveries comprise two counters separated by a bar tending space. The width of the space is usually 840–900 mm (33–36 in.) for one server, or 900–990 mm (36–39 in.) for two or more servers	Waited service	Separated section of the counter																
Length	Counter lengths are related to the nature and concentrations of use, speed of service, bar seating and structural features. Typical lengths are:	Bar catering	A separate part of the counter 3–5 m long (10–16 ft) should be designed for food service with adjacent back-bar cooking equipment and display shelves. Separate dishwashing facilities must be provided (unless disposables used) and for a handwash basin. A separate kitchen or food storage and preparation area is usually necessary																
		<table border="1"> <thead> <tr> <th></th> <th>m</th> <th>ft</th> <th>Customer space</th> </tr> </thead> <tbody> <tr> <td>Lounge or saloon bar</td> <td>6</td> <td>20</td> <td>12–20 standing at bar</td> </tr> <tr> <td>Cocktail bar (variable)</td> <td>5</td> <td>16</td> <td>8 stools</td> </tr> <tr> <td>Dispensing bar</td> <td>2</td> <td>6</td> <td>2–3 waiting staff</td> </tr> </tbody> </table>			m	ft	Customer space	Lounge or saloon bar	6	20	12–20 standing at bar	Cocktail bar (variable)	5	16	8 stools	Dispensing bar	2	6	2–3 waiting staff
			m	ft	Customer space														
Lounge or saloon bar	6	20	12–20 standing at bar																
Cocktail bar (variable)	5	16	8 stools																
Dispensing bar	2	6	2–3 waiting staff																
Ventilation	Balanced ventilation giving 4–6 air changes/hr is required to remove cigarette smoke with inlets distributed in front of the counter. Extraction is essential if catering equipment for frying or boiling is installed																		
Back counter	Provides display and working space:	Lighting	High intensity illumination, 400 lux (40 lumens/ft ²), should be provided with recessed, screened luminaires. Glasswork, mirrors and bright metal lustres add sparkle and animation																
Width	For drinks 480 mm (19 in.) For food cooking equipment 600–750 mm (24–30 in.)	Water supplies	Hot and cold supplies with sealed waste drainage. Glass washing equipment may be installed.																
Equipment	Wine and spirit dispensing with optical measures. Storage of small glasses with adjustable shelves. Work top cantilevered out, allowing clear space under. Cold shelves below (with split refrigeration system). Lower shelves for bottle and can storage. Cash register (may also be recessed in front counter)	Construction	Bar counters and adjacent surfaces must be resistant to the effect of wetting, impact and scraping. Plastic laminates and stainless steel are generally required in work areas but vinyl and leather facings may be provided to soften contact. Wood framework and panelling are commonly used																
Front counter	Used for service of drinks and working levels	Decor	Each bar is usually individual in design and character. Traditional Victorian and Edwardian designs are common in English town 'pubs'. Rustic features are often emphasised in rural inns. Cocktail bars, which have their origins in the lavishly embellished gin palaces of the 19th century, usually adopt distinctive flamboyant styles																
Height	Serving counter 1,000–1,140 mm (39–45 in.) Work top with recessed sink 725 mm (28½ in.)																		
Width	Counter 450–530 mm (18–21 in.) Overall 600–685 mm (24–27 in.)																		
Storage	Shelves for bottles, cans, pots Bin for empties																		
Overhead	Where space is restricted: Glass storage up to 1,830–1,880 mm (72–74 in.) high. Canopy-recessed lighting and ventilation grilles																		

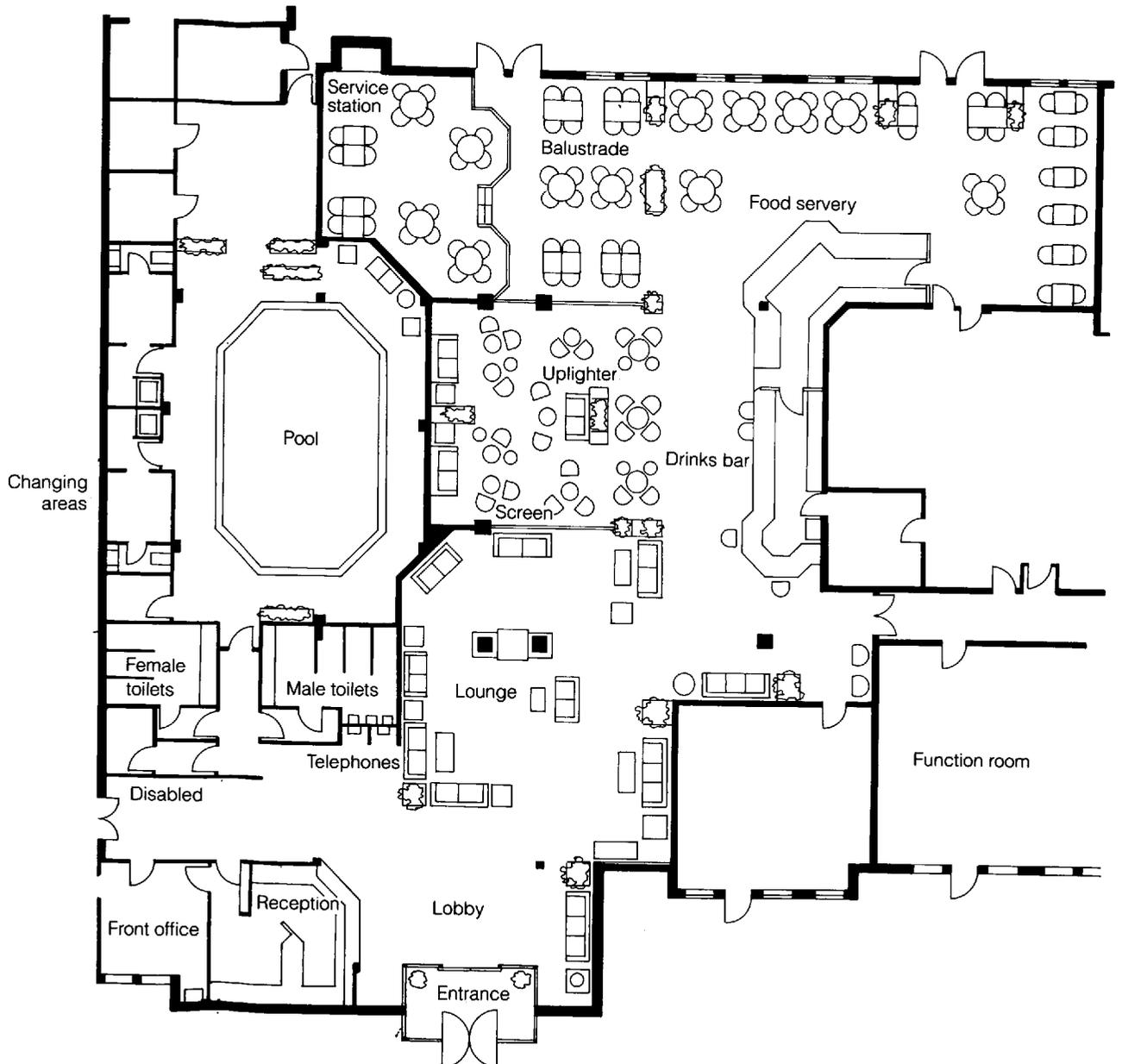


Ladbroke Hotels, Swansea and Livingstone, Ladbroke Lodge, Basingstoke

As part of their development programme Ladbroke Hotels opened a number of new units in 1984-5. The current designs are highly standardised and incorporate many successful concepts in food and beverage operation.

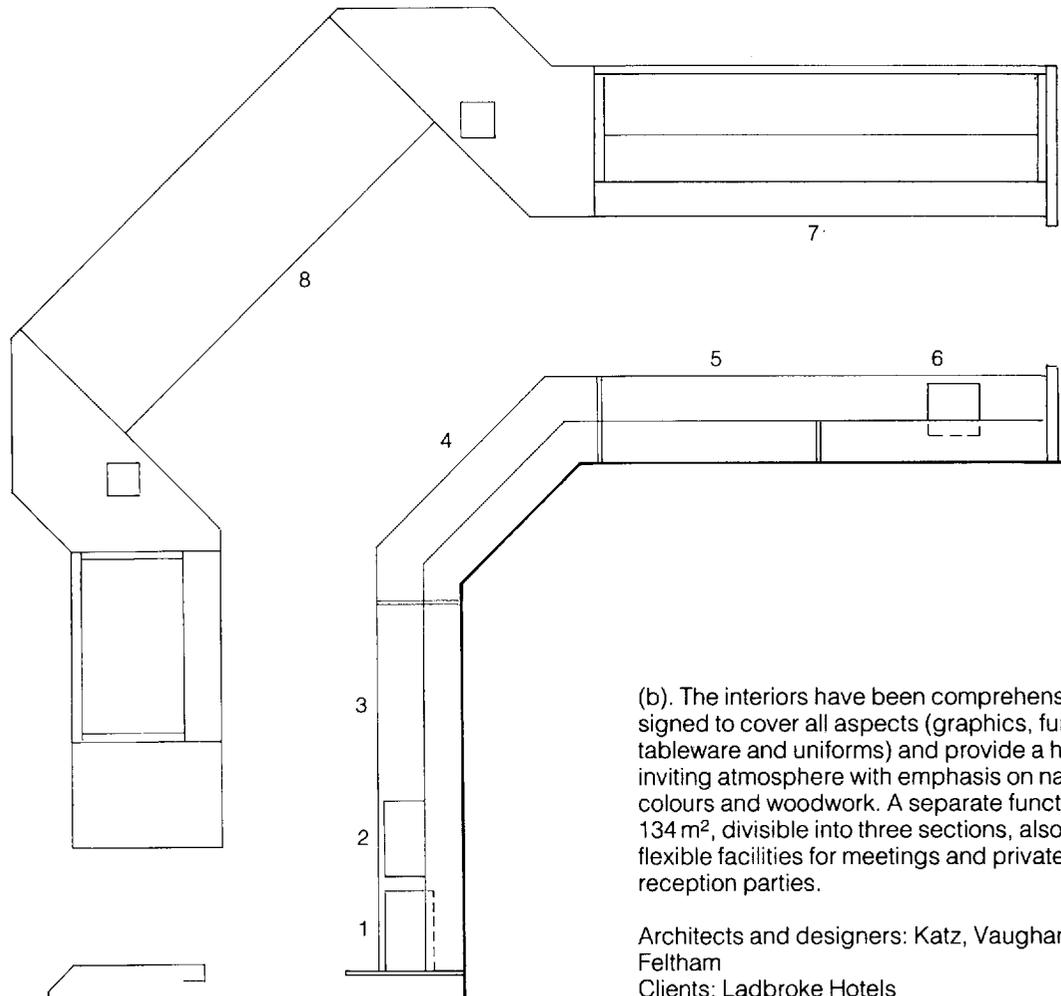
The restaurant (90 seats) is operated with a carvery-buffet counter (a) and table service of starters and sweets. This forms an extension to the drinks bar allowing spatial continuity and dual-purpose use of the lounge (35-40 seats). Personalised areas are created by changes in floor level, balustrades and low screens

(b)



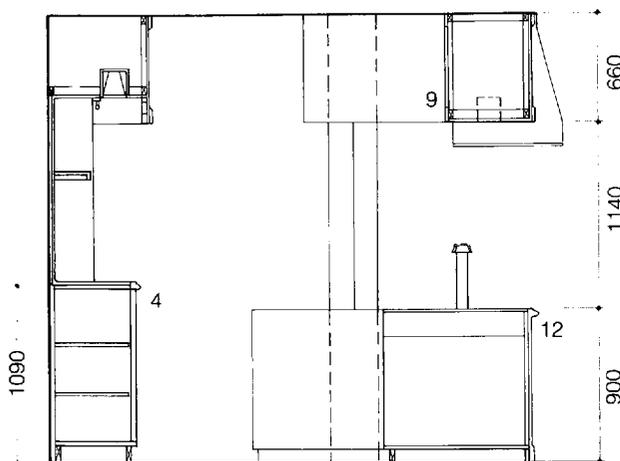
Servery plan and sections

- 1 Lecturn on back-bar, with concealed fluorescent lighting
- 2 Cash register
- 3 Wine display rack over cupboards
- 4 Display counter with shelves above
- 5 Cupboard with shelves above
- 6 Sink
- 7 Refrigerated stepped display unit
- 8 Heated display unit with decorative copper canopy and brass grille
- 9 Low voltage tungsten-halogen downlighters
- 10 Roller shutter over wine display area
- 11 Pygmy bulb
- 12 Concealed strip light under moulding

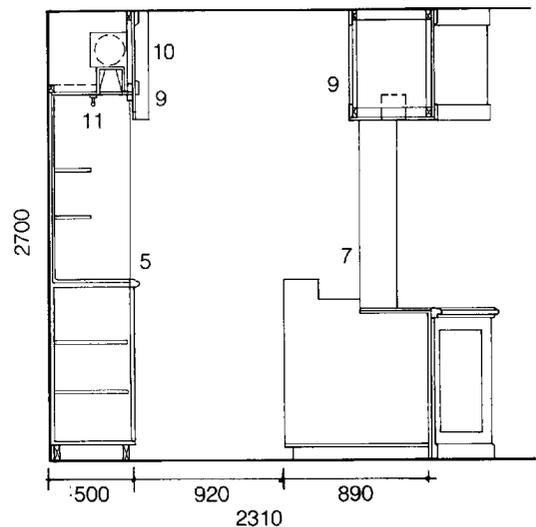


(b). The interiors have been comprehensively designed to cover all aspects (graphics, furnishings, tableware and uniforms) and provide a homely, inviting atmosphere with emphasis on natural, warm colours and woodwork. A separate function room of 134 m², divisible into three sections, also provides flexible facilities for meetings and private dining or reception parties.

Architects and designers: Katz, Vaughan Meyer and Feltham
 Clients: Ladbroke Hotels



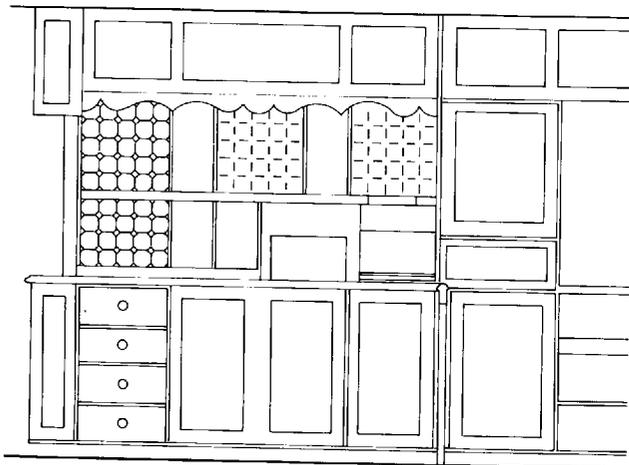
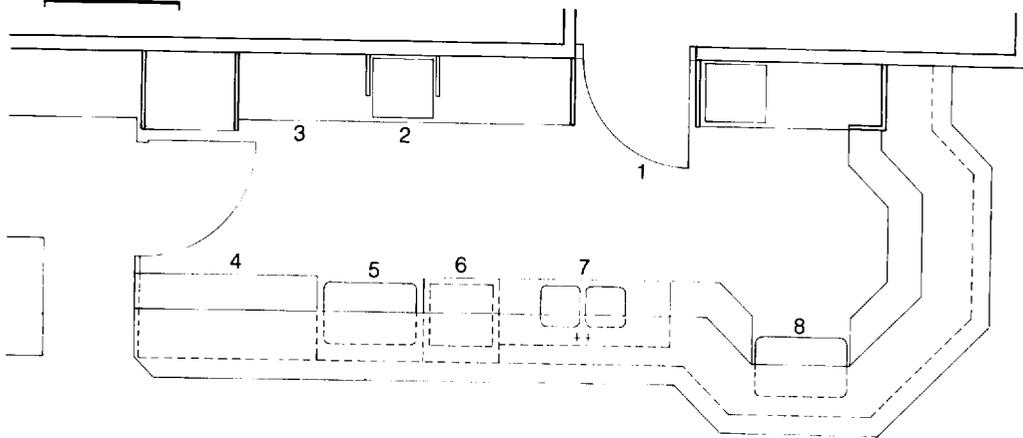
Section B-B



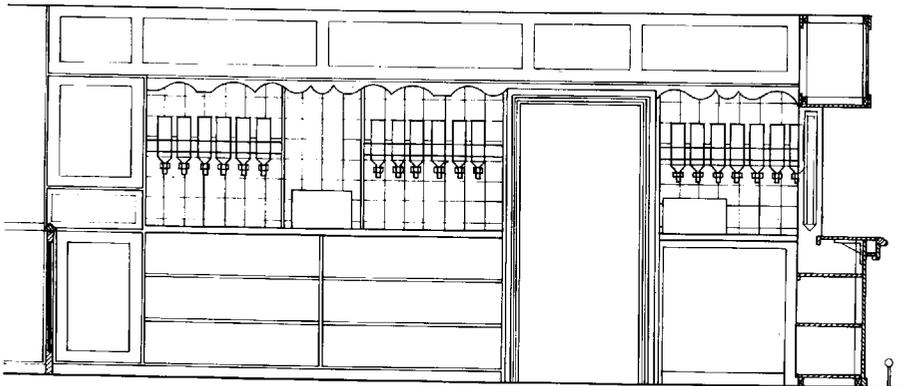
Section A-A

Drinks bar: plans and section

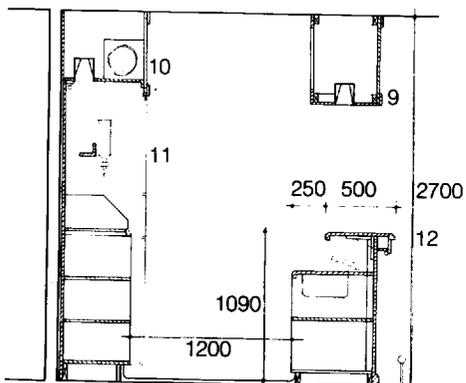
- 1 Access from store
- 2 Cash register
- 3 Worktop with optics rail above
- 4 Wine cooler
- 5 Bottle skip
- 6 Under-counter glasswasher
- 7 Double sink
- 8 Wash-hand basin
- 9 Low voltage tungsten-halogen downlighters
- 10 Roller shutter over drink display area
- 11 Pygmy bulb
- 12 Concealed strip lighting under moulding

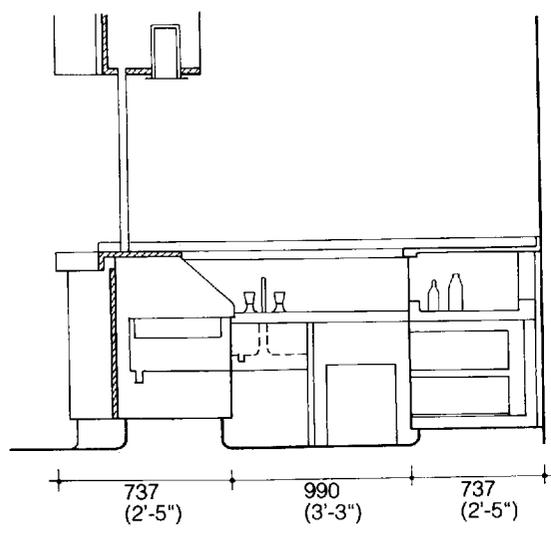
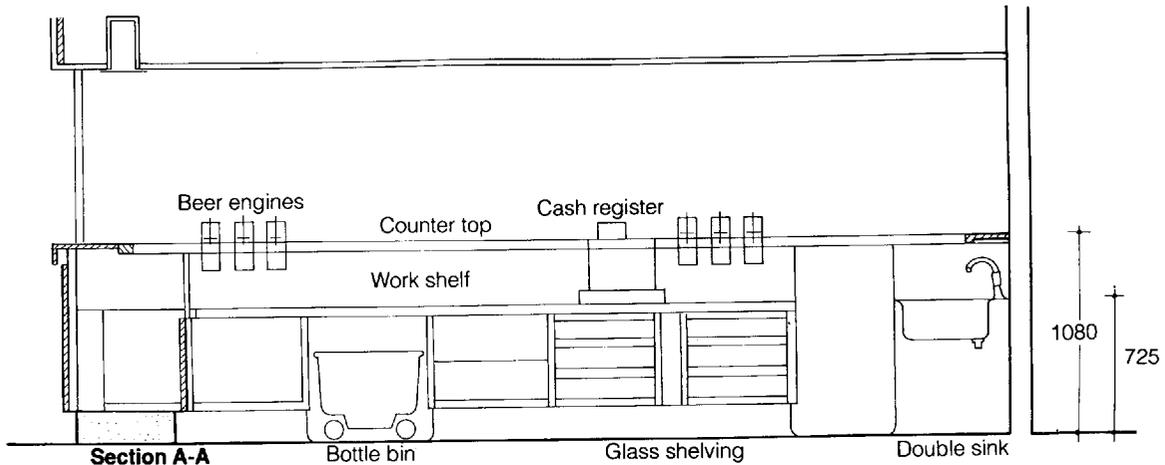
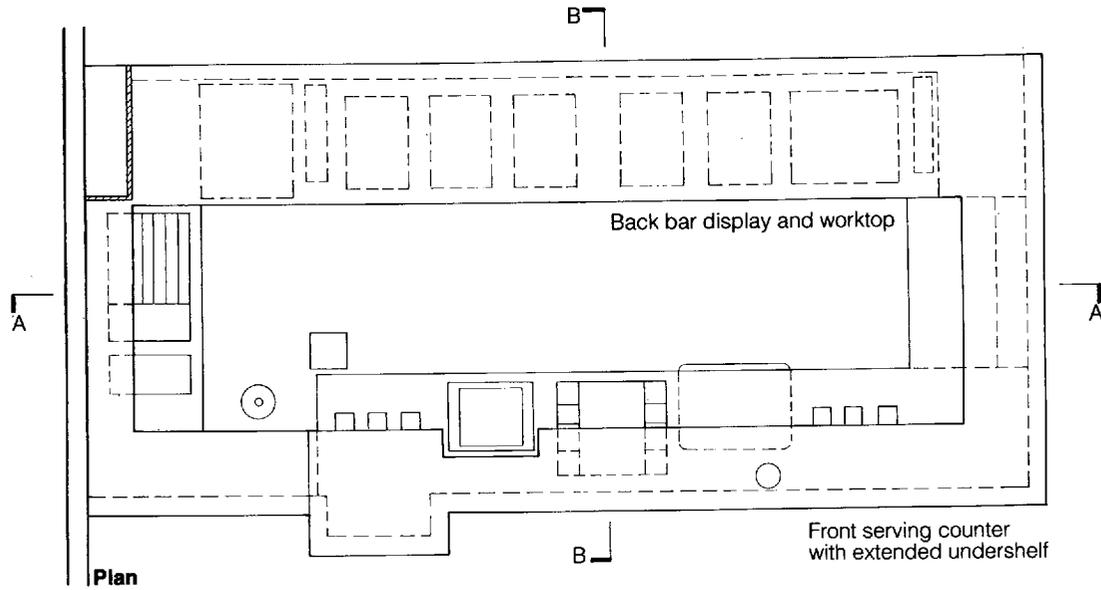


Elevation: wine display racks behind food counter



Elevation: work-top with optic rail behind drinks counter





Bar design: Lancaster Post House

Counter heights range from 1070 (3'-6") to 1140 (3'-9")
 Overall counter widths 610 (2'-0") to 690 (2'-3")



(a)



(b)



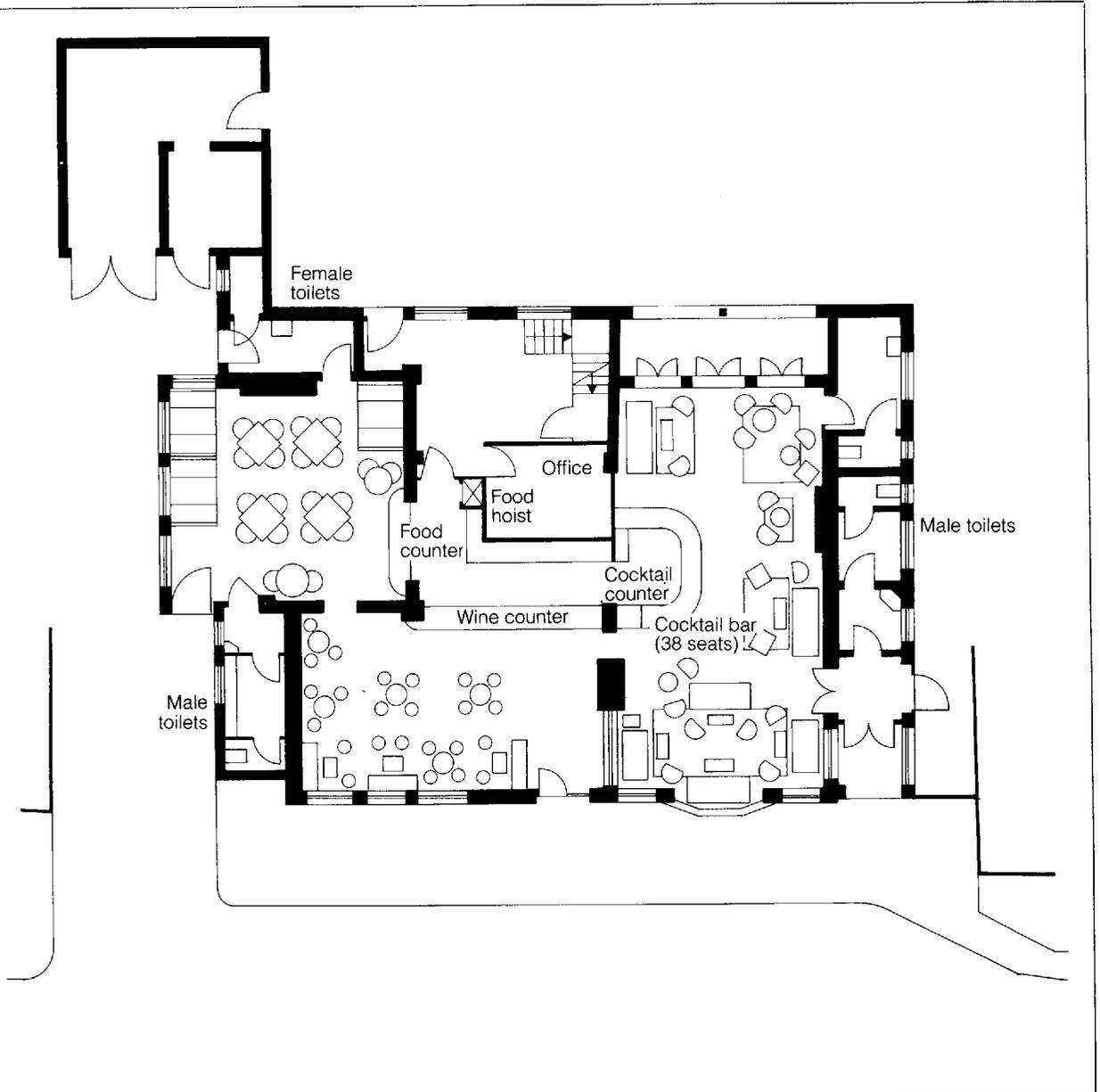
(c)

Sutton Lane, Chiswick

Converted within four months of the initial briefing within a small budget (£55,000), this public house was re-planned to provide a more interesting upmarket interior, replacing 'pub-grub' lunch time facilities with an informal bistro/diner (a); serving simple meals at midday and in the evenings. The food counter is supplied via a hoist.

The wine bar/tap room was relocated (b) and a new cocktail lounge created (c). Although the three areas have a different ambience they involved little structural alteration and much of the furniture was stripped and re-used.

Design consultants: Lee Associates Ltd
Clients: Herald Taverns Ltd



6. Functions and banquets

6.01 Types of functions

Meals for organised groups of customers form a large part of hotel business and may also take place in other premises (city halls, convention centres, clubs, restaurants) on a regular or occasional basis.

Examples of functions include:

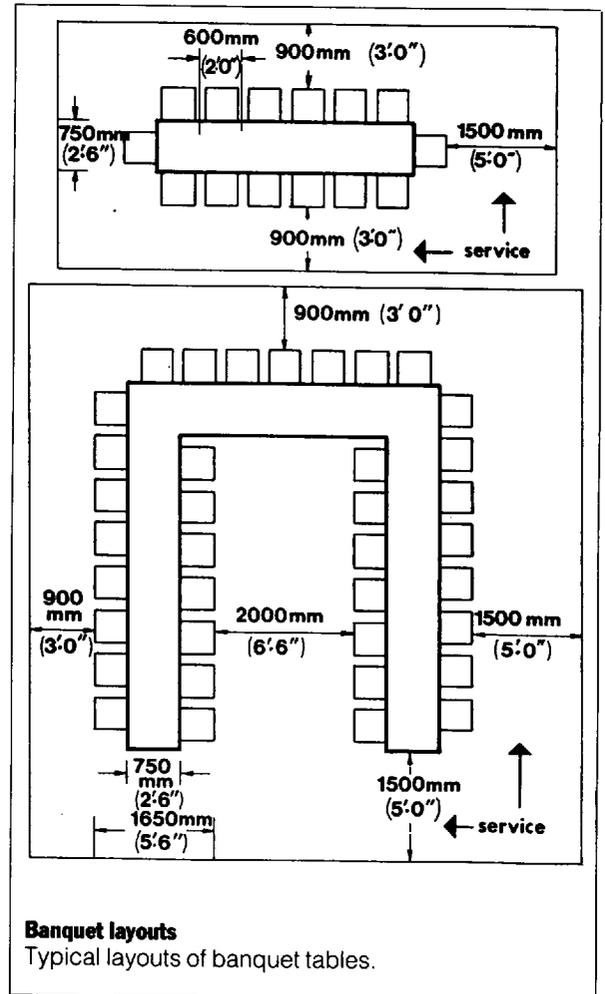
- formal meals – banquets, business lunches, wedding breakfasts,
- receptions – weddings, buffets, balls, civic receptions,
- social events – cocktail receptions, parties, charity lunches, shows,
- conventions – business meetings, social groups, product launches.

Functions call for carefully scheduled food production and precise organisation of service. Since the menu requirements are known in advance, food production can be based on cook–chill systems (see Chapter 8).

For formal events, meals are usually served at the table using either silver service or plated meals.

Less formal meals and receptions normally use buffet service with food laid out on tables or counters ready for self-service.

Requirements	Space and equipment
Cold buffets	Food displayed on dishes, trays and oval flats on buffet tables. Plates stacked at the head of each table with napkins and cutlery at the end of the line
Centre piece	Decorated dishes, floral arrangement, ice carving, company crests, etc. Preferably spotlighted
Hot buffets	Involve plate warmers and portable heating equipment, chafing dishes, etc
Attendance	To assist in service, replenish and redress dishes
Tables	Linked tables (with levelling adjustment) which can be folded and stacked for storage. Special curved and quadrant shapes may be used
Circulation	To accommodate large numbers, service may be provided at multiple points or the buffet divided into two identical sections
Space	The buffet table and circulation may take up 0.7–1.0 m ² per person (7–11 ft ²)
Kitchens	Additional space for preparation and refrigeration of dishes. Increased dishwashing and storage of flats, trays, dishes
Safety	Precautions in service of hot foods and storage of gas cylinders, methylated spirits, etc



6.02 Staffing

Requirements depend on the level of sophistication of service and numbers of customers.

Type of event	Staff	Customers (covers)/staff
Banquets, functions		
Formal silver service	Head waiter or assistant manager Waiter, waitress Wine waiter	In charge of brigade 8–12 25–40
Plated meals	Waiter, waitress Wine waiter	up to 16 30–40
Buffet meals	Chef Waiter, waitress Wine waiter	35–40 25–30 Up to 40
One bar person is required to serve three wine		

7. Catering contracting and off-site facilities

7.01 Catering services

Many of the food services provided for employees or for visitors to institutions, theatres, recreational centres, etc, are operated by commercial catering companies working under contract. Contracts between a caterer and client may be on the basis of an inclusive budget cost, management only fee or fee plus catering overheads.

Catering contracts will usually specify:

- period of the contract, obligations of the client and contractor, sole rights to the catering, penalty clauses for default and means of determination,
- specifications of standards for meals and beverages to be served,
- operating times of the catering facilities,
- budgets, expressed as a cost/head or percentage of annual payroll,
- responsibilities for installation, cleaning, maintenance and replacement of equipment,
- trades union agreements.

Most employee services are subsidised. In some cases, only the food costs or food and operating costs are covered. Catering contractors will usually also provide a design service for the food production and services they offer or they may use existing facilities.

7.02 Outside or off-site catering

Contractors may also operate outside catering services for events such as garden parties, fêtes, sporting events, shows, exhibitions and functions.

The arrangement may be to provide specified meals for an agreed number of customers or to provide refreshments generally on a concessionary or chargeable basis.

Requirements for outside catering usually involve the preparation, transport and service of food and beverages, including any furniture and equipment needed.

<i>Requirements</i>	<i>Considerations</i>
Services	Hot and cold water supplies, drainage, electricity and gas may be available on a permanent or semi-permanent site. In other cases water containers, pressurised gas cylinders, burners and generators will need to be provided with extra costs and restrictions
Equipment	All equipment, glassware, china, etc, will need to be supplied and transported, this involves high insurance and handling costs
Preparation	As a rule most of the food preparation is carried out in advance in a central production kitchen to ensure higher standards
Marquees	Usually hired for the occasion by the client or financed through additional catering charges
Catering units	Specialist caterers may provide purposely designed units brought to, or erected on, the site, complete with equipment and built-in services for coupling to mains
Control	Standards of cleanliness, hygiene, storage and security depend on efficient organisation
Staffing	Skilled, experienced staff are required to supervise and coordinate any casual labour
Losses	High risks are liable to result from inclement weather, breakages, misuse and depreciation of equipment

10

Specific Requirements

1. Full-service restaurants

Restaurants can be classified according to their market orientation and degree of specialisation in menu and style of food service. These characteristics are compared in Chapters 1–5 and some of the more common features are outlined in the following sections. It should be stressed that there are many exceptions to the examples quoted and designs are constantly evolving with the introduction of new fashions and changes in society.

1.01 Haute cuisine and traditional high-class restaurants

Up-market restaurants represent less than 5 per cent of food service establishments in Europe and America and include the more sophisticated restaurants in high-class hotels, clubs and

casinos. They are usually based on traditional methods of food preparation and service, with classical French and European or ethnic cuisines, although they may feature speciality items to provide a more distinctive image.

1.02 Entertainment

An installed audio system with distributed ceiling speakers is essential for background music. Many high-quality restaurants also provide occasional live music (by re-arrangement of seating) or as a regular feature with a permanent stage or band stand.

table 1.01

Market characteristics and location	Interior design features	Menu, food production and service style
<p>Market: high average spending power. Demand inelastic (not responsive to price). Usually open 2–3 hr lunch, 5–6 hr evening</p> <p>Location: in high grade hotel, club, casino or private restaurants in business, theatre or country setting – with a market catchment of up to 15–20 miles</p> <p>Situation: ground, first floor or roof-top level. Preferably with quiet, landscaped or panoramic aspect. Interior screened from public view</p> <p>Size: usually from 60–80 covers in private restaurants, from 80–120 in large hotels</p> <p>Time taken over meals: lunch 1½–2 hr, dinner 2–3 hr, low seat turnover</p> <p>Average spent per person (1985): £15–30/head, depending on region</p> <p>Customer facilities: may include a separate cocktail bar or coffee lounge</p> <p>Cloakroom and toilet facilities: must be of high standard and may take up 0.3–0.35 m² (3.2–3.8 ft²) per restaurant place</p> <p>Life cycle: for major alterations or refurbishment usually 7–10 years</p>	<p>Sophisticated, elegant design, usually conservative with high quality traditional furnishings, linen, silverware and chinaware</p> <p>Space per person generous: 2.2 m² (24 ft²) for gueridon <i>flambé</i> work to 1.9 m² (20 ft²) for table service. Table and seating arrangements flexible. Arm chairs provided for comfort</p> <p>Atmosphere: appropriate for business and entertaining guests. Soft music, good sound absorption, soft, localised lighting, air-conditioning 6–10 air changes/hr</p> <p>Decor: often subtle warm pastel colours with accents (e.g. red, gold, brown) and the use of sheens and shades (velours, satin weaves), rather than prominent patterns</p> <p>Emphasis: is concentrated on the table (high quality appointments) and the presentation of food and wine, with complementary floral arrangements and artistic features</p> <p>Arrangement: spacious with wide separation between tables. Visual separation may be increased by open screens or displayed features</p> <p>Sideboards: must be provided discreetly positioned with screening from direct view</p> <p>Windows: draped for elegance, visual warmth and privacy</p>	<p>Menu extensive, often in French with translations. In distinctive scroll or stylised typeface. <i>À la carte</i> menu usually fixed for 6 months with special items appended daily. Enclosed in stylised folder. Separate wine list – the more elaborate the menu the more extensive the wine list.</p> <p>Food production: large areas usually required 0.8–1.0 m² (9–11 ft²) per cover with conventional equipment. May be based on <i>partie</i> system of specialised areas for skilled work</p> <p>Gross profit: on food usually averages 65 per cent to cover high staff costs and low seat turnover</p> <p>Service: high degree of personal service involving skilled, mainly full-time staff. Hierarchical staff structure usually adopted</p> <p>Staff:customer ratios: food service for <i>flambé</i> work may be as high as 1:6, normally about 1:10</p> <p>Food production: 1:10–1:12, depending on extent of centralisation</p>

Minimum areas required	Space allowances	
	m ²	ft ²
Pianist – baby grand piano	5	54
– upright piano	4	43
Drummer	2–3	22–33
Other instrumentalists	1	11

For staged performances provision will normally need to be made for more sophisticated lighting and audio equipment, for example:

- microphone points (minimum 3) permanently wired and connected to a sound mixer with alternative tape or disk inputs,
- ceiling lighting tracks with adjustable spot and flood lights,
- lighting control system with room dimmer controls and programming facilities for pre-setting stage lighting.

The seating arrangements for entertainment dining must allow an unobstructed view of the stage area. The tables and chairs are generally movable and may be arranged as arcs around the stage with the tables in each row off set.

1.03 Dinner dances

Similar provisions apply to dinner dances. The dance square may be permanent and covered by a fitted piece of carpet when not in use, or be laid as temporary flooring on top of the normal carpet.

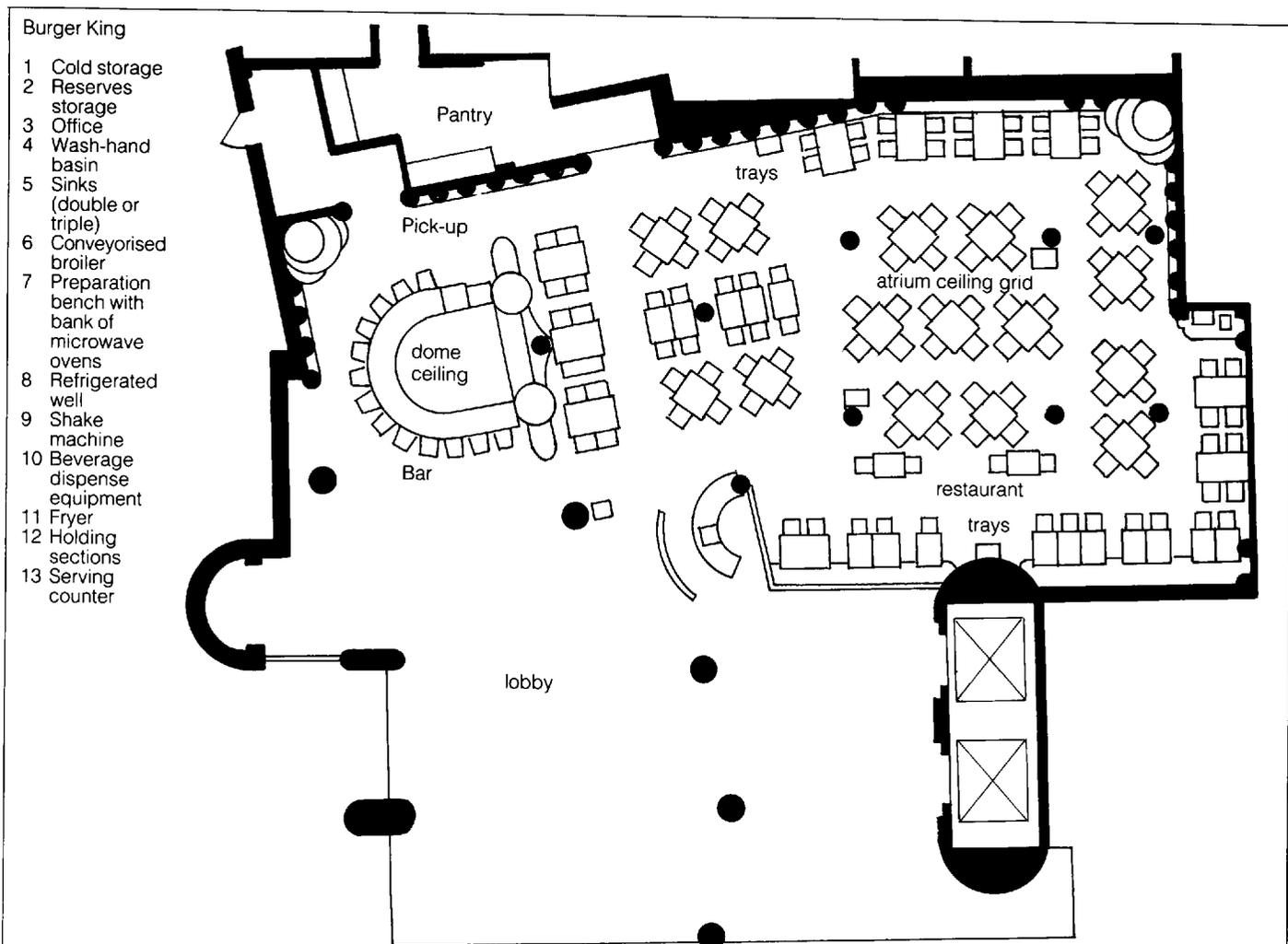
For occasional use a typical dance square might be 40 m² (430 ft²) for up to 100 dinner seats. To allow dancing the tables and chairs are normally more tightly packed together. The overall area (including dance square) is usually about 2.0 m² (22 ft²) per seat.

1.04 Full-service restaurants – mid-market range

In restaurants catering for the middle of the price range the menu and service have to be rationalised. The menu may be standardised (coffee shops), varied on a cyclical basis (store restaurants, family restaurants) or limited mainly to specific food items (steakhouses, seafood, etc). Table service of plated meals is usually offered but alternative counter or buffet service may be provided.

Examples of mid-range restaurants:

Market characteristics and location	Interior design features	Menu, food production and service style
<p>Coffee shops Market: hotel guests, travellers, shoppers. Depending on location may be open up to 18hr/day to provide convenient, informal meals at any time. High seat turnover – 4–6 times/day</p> <p>Time taken over meal: lunch ½–1 hr, dinner 1–1½ hr, average spent per person, £8–12.</p> <p>Life cycle: 5–7 years</p>	<p>Usually based on a themed or stylised modern design but may incorporate local features -</p> <p>Compact seating: 1.5–1.9 m² (16–20 ft²) per cover. Often with counter and banquette or booth seats in addition to free-standing chairs</p> <p>Tables: left exposed with place mats, or covered with brightly coloured cloths</p> <p>Counter display: usually provided for self-selection of food</p> <p>Atmosphere: bright, relaxing, brown, cream or green decors. May be extended in a greenhouse or solarium to form a garden restaurant (see below).</p>	<p>Menu: standardised, suitable for all meals, usually retained for 1–6 month period. <i>Table d'hôte</i> menu normally provided with a high percentage of convenience foods. Gross profit typically around 60 per cent. Menu often illustrated and laminated or otherwise protected to allow frequent handling. Separate selected wine list.</p> <p>Employee: customer ratio about 1:20 at peak periods</p>
<p>Cafés, patisseries and garden restaurants Similar emphasis on selected menus offering informal meals in good quality settings.</p> <p>Market: Orientated towards female groups (shoppers) e.g. patisseries, garden restaurants. High standard cafés are similar but with a broader market coverage</p>	<p>Light, airy decor with white, green, yellow or fresh pink colours. Light, open-framed furniture. Floral and foliage arrangements, including trellises designed to separate areas without reducing space</p>	<p>Self-selection of salads, open sandwiches, gâteaux with attractive chilled displays (including island arrangements). Selected menu of light meals. Neat, friendly serving and waiting staff</p>



Ambrosia Caesar's, Atlantic City

A spectacular club design which blends Regency and Art Deco styling in the restaurant and adjacent lobby bar of the Broadwalk Regency Hotel Casino. The dining area seats 134 and the bar 13.

Designers: Di Leonardo International Inc
Photographs: Warren Jagger



1.05 Speciality restaurants – mid-market range

The mid-market range also includes steak and seafood restaurants, continental restaurants (trattoria, brasseries). Specialist restaurants include grills and rotisseries, and good ethnic restaurants (Japanese, Indian, Chinese, Thai, etc).

Marketing emphasis is usually placed on the difference in style, atmosphere and the experience the meal provides and this must be expressed in design and operation.

Ethnic design, including Italian, Greek and Spanish restaurants are examined in section 3.

1.06 Licensed premises

Many licensed premises that sell alcohol separately also operate as restaurants. Food services may be traditionally provided in inns and bistros or introduced to extend the business, as in public houses. Restaurants may specialise in a particular food, such as steakhouses, or serve a limited *table d'hôte* menu of regional dishes and other popular food items. Wine bars, bistros, pub-restaurants, taverna, etc, are considered in table 1.06.

table 1.05		
Market characteristics and location	Interior design features	Menu, food production and service style
<p>Market: business and professional persons working in area, tourists, for evening meals, entertainment or special occasions</p> <p>Location: speciality restaurants are most common in city centres, near commercial areas off main streets</p> <p>Seat turnover: usually 2–3/day. Size: speciality restaurants have usually 80–100 seats, although continental family-run restaurants may be smaller (60–80)</p>	<p>Based on food theme providing an integrated product. The serving counter or back-bar cooking equipment may be a feature of the design.</p> <p>Decor: colours usually chosen to compliment the particular food being served, e.g. steak (red, brown), seafood (white, blue)</p> <p>Seating: typically 1.4–1.8 m²/person (15–20 ft²), compactly arranged in recessed booths or combined with banquette seats. Table settings rather than cloths used</p>	<p>2 or 3 course fixed <i>table d'hôte</i> menus typical. Emphasis placed on speciality foods (steaks, seafood, etc) which are usually supplied ready portioned (fresh, chilled or frozen)</p> <p>Specialised equipment is often required, e.g. char broiler, grill, rotisserie, pressure fryer.</p> <p>Production areas: usually small, from 0.3 m²/seat for limited menu, convenience foods to 0.6 m²/seat where more extensive preparation is involved. For high cost foods the gross profit can be 55–60 per cent requiring rationalisation of labour costs (25–30 per cent).</p> <p>Service: may be semi-silver or plated. A selected wine list is usually offered</p>
<p><i>Continental restaurants</i> Similar markets but they also provide a more intimate atmosphere for evening meals (candlelit, music, <i>flambé</i> service)</p>	<p>Usually express their traditional character, e.g.</p> <p>Brasseries: Parisian style ornamentation, usually with large mirrors, and etched glass and decorative brasswork</p> <p>Trattoria: Italian designs (decorative tiling, greenery, alcove seating, etc)</p>	<p>Often provide an extensive <i>à la carte</i> menu for evening dining with national and regional dishes. The serving station may be prominently featured in the design</p> <p>Specialist equipment: often required for Italian food (pasta preparation, pizza ovens, etc).</p>

<i>Market characteristics and location</i>	<i>Interior design features</i>	<i>Menu, food production and service style</i>
<p>Mainly 20–35-year-old professional and business clientele requiring informal meals and social contact</p> <p>Location: town centres, off main streets, and country inns in suburban areas</p> <p>Main meals: weekday lunches, weekend meals. Average spent £5–8</p>	<p>Emphasis: on character of premises and relaxing, social atmosphere.</p> <p>Space usually limited, 1.1–1.3 m²/seat (12–14 ft²)</p> <p>Seats: grouped in alcoves or booths with both loose chairs and fixed wall or banquette seating.</p> <p>Decor: often rustic with dark woodwork, heavy furniture, painted plaster or stucco walls and numerous personal features (antique copper and brasses, prints, posters, bottle displays, etc)</p> <p>Furnishings: as a rule simple crockery, coarse linen, wood and wicker accessories, chunky-stemmed glassware are used to add character, with strong sense of colour (bright red napkins, green foliage)</p>	<p>A limited menu is usually necessary to save space and labour. Dishes may be supplied ready prepared for re-heating (if needed) and service. The menu may vary from day to day and may be handwritten on card or blackboard</p> <p>Equipment: usually restricted to an oven, boiling hob, grill, fryer, bain-marie and microwave oven with refrigerated storage</p> <p>Beverages: usually supplied from the bar. In wine bars an extensive range (50 or more) of wines is usually offered</p>

<i>Market characteristics and location</i>	<i>Interior design features</i>	<i>Menu, food production and service style</i>
<p>Price sensitive: (elastic demand). Limited range, inclusive charges</p> <p>Main emphasis: placed on controlling costs, balancing selling prices against volume of sales</p> <p>Demand: often highly concentrated at midday. May be restricted to day use (store, public buildings)</p> <p>Market: shoppers, visitors, family groups (usually specific to location).</p> <p>Seat turnover: 3–4 times/day</p>	<p>Standardised designs: used for chain operations (promotion, cost saving, efficiency)</p> <p>Practical considerations include: means of table cleaning (tray or trolley circulation), maintaining tidiness (fixtures), appearance (materials, colours, patterns) and conditions (durability and ease of replacement)</p> <p>Seats: usually fixed in standard format with extra loose chairs for children</p> <p>Decor: often neutral but features of personality (posters, local artifacts) or domesticity (flowers, check curtains, bright napkins) may be added</p> <p>Space: usually restricted to give high seat capacity and turnover. For table service 1.1–1.3 m²/seat</p> <p>Cafeterias: the counter and circulation add about 40 m² (430 ft²) or from 0.3–0.4 m²/seat</p>	<p>Menus are usually standardised with a choice of 2 or 3 main items, plus a variety of prepared sweets, sandwiches and salads</p> <p>Production: rationalised to reduce space and labour</p> <p>Convenience food: often used and in chain operations production may be largely centralised. In small units food may be cooked to order</p> <p>Equipment: typically wall sited, usually includes one or more oven ranges, deep-fat fryer, salamander, griddle, bain-marie, hot cupboard, beverage set</p> <p>For light meals: toaster, microwave oven and boiling rings</p> <p>Refrigeration: required for food and beverage storage and display of food</p> <p>Gross profit margins: usually around 60 per cent (higher for snacks)</p> <p>Employees: usually trained on the job under supervision</p>

1.07 Popular restaurants: full service restaurants and cafeterias

Catering for a wide market (family, travellers, visitors), popular restaurants usually offer a moderate choice of menu which may be set or may vary from day to day over a period of time. These include chain restaurants along highways, in departmental stores and shopping precincts, restaurants in recreational centres and public buildings and family-owned cafés. Food may be served at the table with plated meals or from self-service counters arranged in cafeteria lines or as a free-flow system (food hall).

2. Fast-food operations

2.01 Expansion of fast food

Fast food represents the most rapidly growing sector of the food-service industry. While most of the system-based operations were developed in the United States many of the large corporations have expanded into other countries either directly or by joint investment, licensing or franchising arrangements. In addition, many national companies have set up their own fast-food operations using similar products or based on local foods (see Chapter 1, section 3.03).

In the United States there were over 103,000 fast-food units in 1984, representing 26.4 per cent of all commercial establishments and these accounted for 30.7 per cent of all food and beverage sales (see Chapter 1, section 3.03).

In Europe, fast-food development has varied greatly from one country to another depending on chain initiatives and life style. The main penetration has been in Great Britain and West Germany which together accounted for over 70 per cent of the total fast-food market in 1984. Fast-food sales in Great Britain were estimated to amount to between £1,800 and £2,200 million in 1984, one third of the total market for meals outside the home (see Chapter 1, section 2.02).

2.02 Features

Fast-food operations are designed around systems of catering which provide a limited range of highly standardised products. They rely more on high volume sales and tight control over costs and margins to provide competitive prices. The key requirements for fast-food systems may be summarised as follows:

<i>Features</i>	<i>Requirements</i>
Food materials	Consistent, controllable quality, precisely specified, equally portioned
Type of products	Suitable for quick cooking and retention for short periods without deterioration
Organisation	Highly organised routines with precise job specifications and procedures
Operation	Usually planned for large throughput, high sales volume (including counter sales)
Cost control	Precise portion and cost control permitting relatively small margins and competitive pricing
Quality control	Standard preparation, cooking and serving routines laid down, including the discarding of sub-standard (e.g. maximum times for keeping food before serving).
Hygiene	Exacting requirements emphasised as part of product reliability, including measures to reduce litter (in store and neighbourhood)
Packaging	Products distinctively packaged (disposables), easy to handle (usually finger held), suitable for over-the-counter or table meals
Research	Product research and consumer response testing essential. Ongoing research into changing food preferences and attitudes is necessary to develop new concepts
Variety	May be provided in product range offered or by variations in one basic product (dressings, fillings, supplements)
Markets	Usually targeted at wide, classless society, primarily young or family group
Promotion	Emphasis is given to value for money, consistent quality and cleanliness. Particular products may be differentiated by originality, size, cost competitiveness, variety of choice or fillings, healthy eating, friendly service

2.03 Products

While many foods could be suitable for system-

based production, fast-food chains usually concentrate on products with universal appeal such as hamburgers, chicken, pizza and ice cream. National products are also prominent – fish and chips in Great Britain, Mexican tacos (United States) or sushi (Japan) – and there has been a growth in the popularity of ethnic food (Chinese, Indian, Turkish, etc).

Alternative products are constantly being researched both in terms of market attraction and production needs. Many fast-food operators have extended their standard range to offer wider variety in choice and to meet changing demands, for example:

- hamburger, chicken and fishburger options,
- salad bars, baked potato counters, health foods,
- alternative menus (for breakfast, at weekends),
- national variations (such as German wüst, Italian pasta, Danish smöresbrod, French croissanterie).

Decisions on the type of products are critical in deciding equipment to buy and operating requirements – see 1.05

Packaging provides a distinctive merchandising as well as functional role and a company's style appears in napkins, containers and packs. Containers for hot food may be of coated card or

paper, laminates, moulded plastics or aluminium foil. Tableware suitable for the oven has been developed for particular foods.

2.04 Location of premises

Prime high street locations are generally necessary for the large company-owned units generating high volume counter sales. Competition for high street sites from other operators as well as from retail stores is often intense and both capital investment and rental charges are high.

The feasibility of city centre development depends on large volume sales with extended periods of use, typically over a fifteen hour day, seven days a week. Off-high street and urban traffic route locations are preferred by some chains to reduce rental charges and assist franchise investment and operation.

In the initial stages of development or expansion into a new region, units tend to be company owned in order to establish standards and marketing information. Investment may also be channelled first into selected areas such as capital cities, in order to concentrate media coverage and establish a suitable image. Site selection depends on the type and scale of operation but invariably the following criteria are relevant:

Criteria	Examples						
Market catchment	Population and socio-economic structure of area. Local attractions for shopping, work, leisure, tourism						
Pedestrians	Pavement flows of at least 500 persons/hr may be stipulated						
Vehicular traffic	Parking facilities, garages, shops and activities in vicinity						
Sales forecasts	Sales outputs vary widely, depending on location and type of products. Take-away sales are necessary to achieve high volumes						
	<i>Location</i> <i>Examples: sales/week</i>						
	Large high street units (with daily variations from 750–3,000 sales) 10–15,000/week						
	Large town centre units 5–8,000/week						
	Smaller units 1,500–2,000/week						
	The largest company owned units in prime locations may have sales of 30,000/week or more.						
Size of units	Sizes of units depend on the type of service and products:						
	<i>Type of franchised units</i> <i>Average sizes</i>						
	Large counter and table service 325–465 m² (3,500–5,000 ft²)						
	Small counter service units 95–140 m² (1,000–1,500 ft²)						
Average customer spend	For typical hamburger style units(a), average spend (1984):						
	<table border="0" style="width: 100%;"> <tr> <td style="text-align: center;"><i>Food</i></td> <td style="text-align: center;"><i>Drink</i></td> <td style="text-align: center;"><i>Per customer</i></td> </tr> <tr> <td style="text-align: center;">£1.00–£1.50</td> <td style="text-align: center;">30–35p</td> <td style="text-align: center;">£1.30–£1.85</td> </tr> </table>	<i>Food</i>	<i>Drink</i>	<i>Per customer</i>	£1.00–£1.50	30–35p	£1.30–£1.85
<i>Food</i>	<i>Drink</i>	<i>Per customer</i>					
£1.00–£1.50	30–35p	£1.30–£1.85					

(a) Popular Food Service, December 1984/January 1985.

2.05 Costs

Investment costs for fast-food units are usually high, for a number of reasons:
 — the design is part of an integrated product, including detailed specifications of the style of decor, equipment and uniforms,
 — wear and tear and obsolescence are high, giving relatively short life cycles (3–5 years),
 — equipment is usually specified to meet high standards of sophistication with automatic timing and control, fast heat recovery and high performance requirements. Increasingly, computer controls are incorporated both for production and accounting control.

Typical development costs (1984 prices) for large high street units (325 m²) ranged from £300,000 to £500,000, with up to £200,000 being spent on equipment, although some of the largest company units involved expenditures up to £740,000. The smaller units (95 m²) typically required capital investment of between £50,000 and £100,000.⁽¹⁾ These figures exclude the costs of acquiring property.

2.06 Operational requirements

Most fast-food operators aim for a door time (entering to leaving) not exceeding 3½ minutes with a maximum queueing time of 2½ minutes, allowing 1 minute from placement of order to service.

<i>Typical features</i>	
Entrance	Wide, conspicuous. Large stores may be open to a public thoroughfare or concourse during service periods (with 'air curtain' conditioning). Information clearly visible (photographs, signs, logos)
Counter	Set back from entrance with free circulation/queueing area. Multi-point service provided in large stores. Information displayed over counter area, (angled). Counter normally 600 mm (24 in.) deep. Space for service: 600–750 mm (24–30 in.) width plus 600 mm (24 in.) for cash register
Serving area	Usually about 1,050 mm (42 in.) deep to allow easy circulation
Production	Food holding units adjacent to servery. Production area open to view. Equipment details specified
Table seating	To one side of main circulation. May be on upper or lower floor level

Dispensers	For paper napkins, plastic cutlery, trays, condiments. Usually built into counter with additional self-help points in restaurant area. Disposable collection points provided near circulation routes with self-closing lids
Design	Clean, bright decor emphasised with practical considerations (durability, cleaning, function). The trend is towards natural wood, decorative ceramic tiling and softening with texture (in panels, seating) using domestic substitute designs

2.07 Equipment

One of the basic concepts of fast-food operations is to be able to use non-professional workers with minimum training. To facilitate this, equipment must be reliable, giving consistent and uniform cooking performance, rapid heat recovery with high output capacity and automatic control with the minimum of attention. In the larger units conveyorised cooking equipment is often installed. For chain operations and franchising, equipment is usually manufactured to company specifications and suppliers may be nominated as part of the agreement. The type of equipment required will depend on the food products and output involved. The following summary outlines some of the main items used and current developments in equipment technology.

<i>Equipment</i>	<i>Typical features</i>
<i>Service equipment</i>	
Counter dispensers	Normally include coffee system, milk shakes and carbonated drinks dispenser (with python lines from rear storage) ice dispenser and dispensers for paper cups, lids and napkins
Electronic cash registers	Micro-computer driven management information systems usually installed providing inventory control, sales mix analysis, sales per labour hour, etc
Satellite transfer systems	In chain operations, teleprocessing transfer of data to central computer (usually at night) for group analysis and feedback
Closed circuit television, etc	For store security management control and information. Microphone ordering and recording also used
<i>Cooking equipment</i>	
Fryers	High heat recovery and precise

	control necessary. Usually micro-processor controlled with self-monitoring programmes, automatic basket raising and lowering, automatic integral oil filtering
Broilers	For grilling hamburgers. In larger units, conveyor driven equipment installed with speed and temperature adjustment. Conveyorised equipment is also used for toasting buns
Pressurised fryers (broasters)	For chicken, barbecued ribs, fish fillets, beef specialities, etc. Provided with automatic temperature and pressure controls and safety devices
Pressurised steamers	May be used for shellfish and other foods. Usually with free-venting-pressure option. Programmed temperature-time control and steam regulation essential
Griddles	For shallow frying (hamburgers, onions, etc). Specifications require high output, uniform surface heat, sensitive thermostatic control, rapid response and non-stick surfaces
Special ovens	For pizzas, etc. Similar requirements to allow intensive use with evenly distributed temperature control. Process controlled rotary ovens may be installed
Soup kettles	Usually designed for heating and holding soup ready for service. Uniform and sensitive temperature control essential
Microwave ovens	For quiches, pies and prepared composite foods. Back-bar sited microwave ovens with automatic controls may be installed as a main or supplementary service
<i>Holding and merchandising equipment</i>	
French fry dumps	Specifically designed with heated well, perforated scooping insert, infra red lamps and associated storage. Automatic dispense units may also be used. Products are rejected after a set time limit
Merchandisers	Combined holding and merchandising equipment which may be heated or chilled, and provide a static or rotating (carousel) display
Bains-marie	May be fitted in back counter equipment for sauces, vegetables, stews, etc. Indirectly heated and thermostatically controlled
Salad bars	Chilled displays of salads in specially designed trays fitted with transparent guards

2.08 Storage and preparation equipment

Food may be delivered ready portioned and frozen or chilled, or supplied fresh requiring some preparation on site (for trimming, portioning, dressing or coating the food). Essential requirements include:

- deep freeze and refrigerated stores: usually with separate compressor systems for noise reduction and heat recovery,
- deep sinks and drainers: for washing equipment and utensils. Specialised equipment may incorporate self-cleaning water lines,
- handwashing facilities: for staff, sited adjacent to staff toilets and to the preparation service areas.

2.09 Organisation

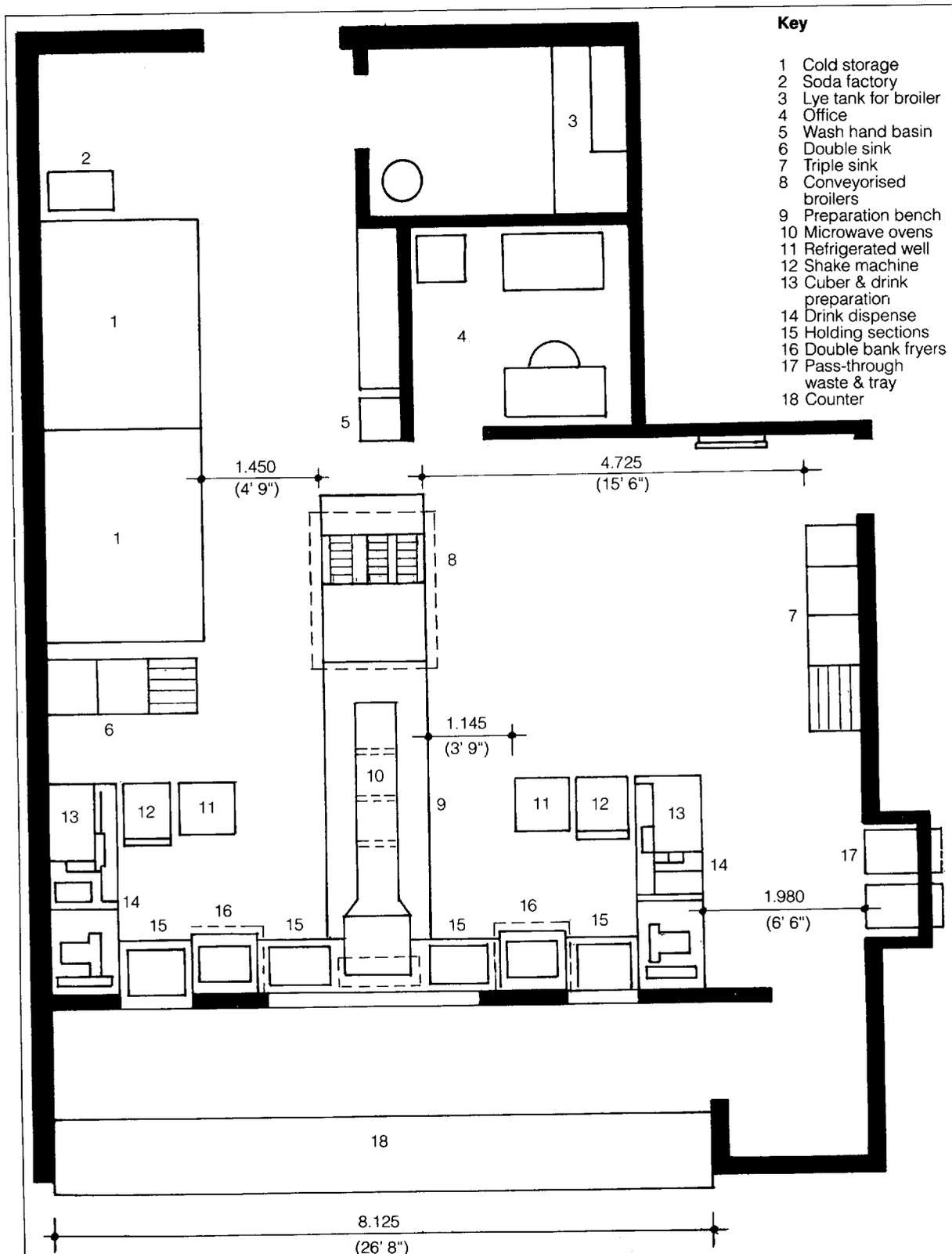
The job descriptions and titles traditionally used in food services do not apply in fast-food services. Employees may be service-till operators, backers and crew with specific allocated duties. Employment is usually scheduled to enable shifts to overlap at peak periods (usually midday) and a high proportion of part-time staff may be used.

For a typical hamburger-style operation, equivalent full-time employees would be about thirty in a provincial town, up to fifty in a busy high street unit.

2.10 Feasibility

Projects may not be considered viable unless they are likely to achieve suitable operating ratios averaged over the first five years. Two examples are quoted:

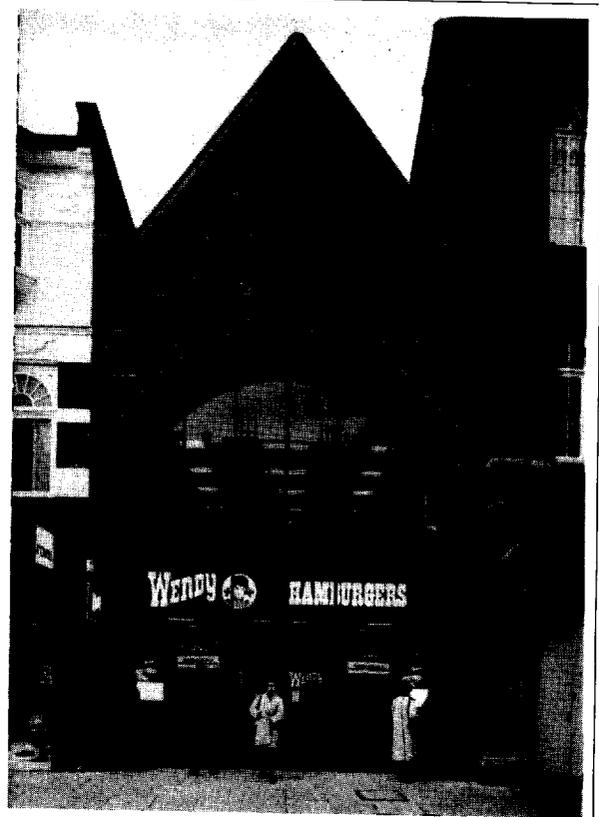
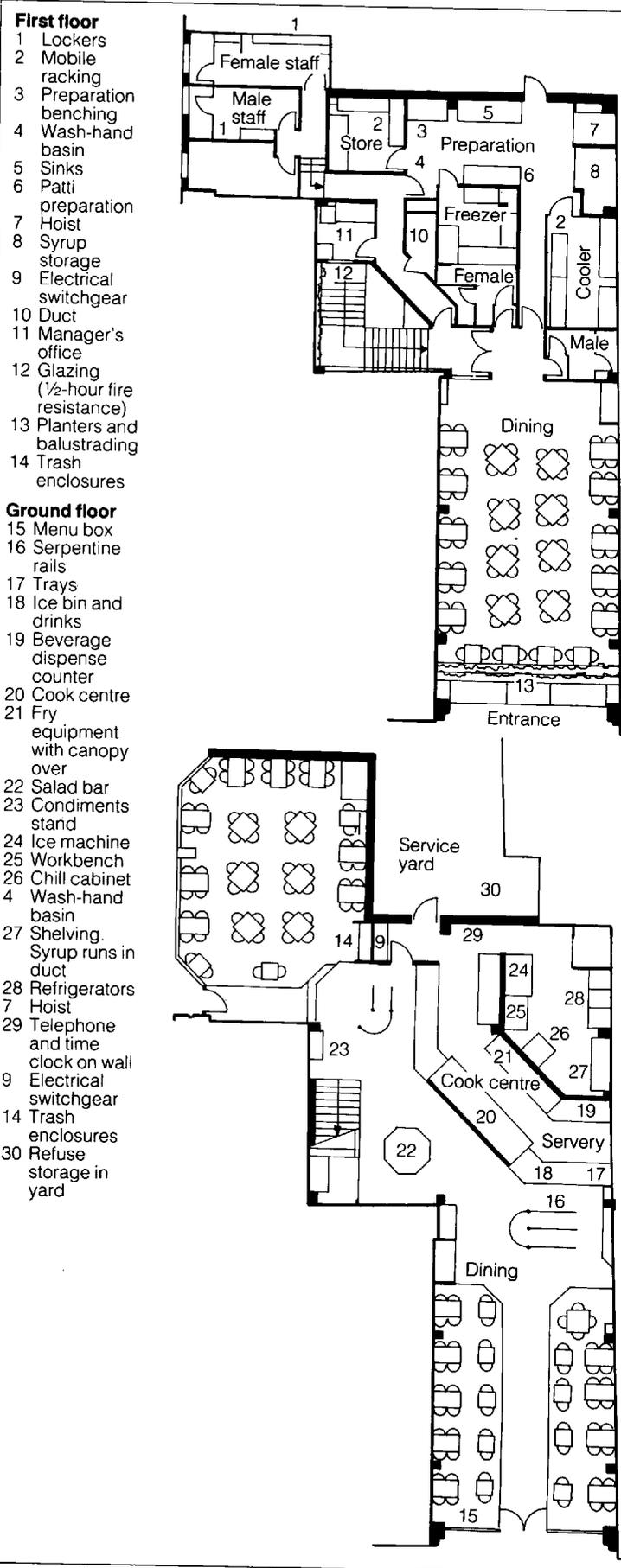
<i>Operating ratios</i>	<i>% of total revenue</i>		<i>Notes</i>
Turnover	100	100	
Food and beverage cost	35	38	Hamburger – 38% Pizza, etc, 35%
Gross profit	65	62	
Labour costs	20	20	Tightly controlled. Crew rostering essential.
Overheads	5	9	Energy, utilities, disposables, cleaning, renewals.
Rent and rates	12	10	Relatively high (prime sites), includes insurance.
Franchise fees	8	8	Depends on agreement, group advertising.
Net profit (before tax, interest and depreciation)	20	15	Typical range



- Key**
- 1 Cold storage
 - 2 Soda factory
 - 3 Lye tank for broiler
 - 4 Office
 - 5 Wash hand basin
 - 6 Double sink
 - 7 Triple sink
 - 8 Conveyorised broilers
 - 9 Preparation bench
 - 10 Microwave ovens
 - 11 Refrigerated well
 - 12 Shake machine
 - 13 Cuber & drink preparation
 - 14 Drink dispense
 - 15 Holding sections
 - 16 Double bank fryers
 - 17 Pass-through waste & tray
 - 18 Counter

Typical hamburger production layout using conveyorised equipment
 The Burger King group has over 3,800 outlets worldwide. All products, equipment and supplies must conform to strict specifications. The call-order layout is designed in a double 'T' layout for highly efficient production, with a conveyor-broiler supplying dual

preparation areas backed up by microwave ovens for cheese melting, deep fryers for chips and onion rings, and a conveyor toaster. The system aims to supply meals to call-order within 30 seconds. Ten to 15 counter staff are linked by microphone to the kitchen area in which there may be up to 25 staff working at the same time.



Wendy Restaurant

Wendy's is a popular fast-food franchise operation with over 3,440 units in 19 countries, the sixth largest restaurant chain worldwide. Some 400 units were planned to be opened in 1986.

The menu covers hamburgers, french fries, breakfasts, salads, baked potatoes, chicken sandwiches and chillis.

Units incorporate similar facilities and styling adapted to particular layouts, although free-standing buildings are also used. The architectural design provides full details. Stores may be single line or two line with two points of sale at peak periods staffed by about 12.

Building and fitting out costs range from around £140,000 (£370/m²), single line, to £288,000 (£625/m²) depending on location and type of property. Electrical and mechanical services usually account for about 40 per cent, shopfront 2.5 per cent and signage 2 per cent. Contract periods are usually 10 weeks.

Examples illustrate the sensitive design of a unit in an existing property in Richmond.

Architects: Michael Elboz, RIBA
 Contractors: Hayward Contractors
 Clients: Wendy Restaurants Ltd

2.11 Franchising agreements (see Chapter 2, section 3.01 etc)

Typical agreements, based on 1984 figures, provide for the following:

Starting up franchise fee	Varies from £2,000 to £10,000, depending on the services and capital costs involved
Annual franchise fee	Usually provides for a 4–5 per cent royalty and 3 per cent advertisement fee. In some cases fees may be covered by a mark-up on products
Franchise period	Specified by agreement. In some cases ten years (renewable) is stipulated

Most franchisers estimate the potential profitability per annum (before interest, tax and depreciation) to be in the range of 15–20 per cent.⁽²⁾

2.12 Trends in fast-food development

Fast-food operators are constantly looking towards innovative designs, new products and diversified outlets.

Products are increasingly being targeted towards adult and health-conscious markets by featuring side salad, fresh orange juice, whole-meal buns and low-fat products.

Diversification is being achieved by agreements with breweries, retail stores and other establishments for joint development of fast-food chains, thus obviating one of the difficulties of site acquisition.

New designs include the introduction of mini-bar units to reduce franchise capital investment and allow the siting of units in shopping courses, malls and places of work.

3. Ethnic and speciality restaurants

3.01 Development of ethnic food service

A growing awareness of ethnic food has been brought about by tourism, immigration and media presentation of different forms of diet and cooking.

Many ethnic diets such as Indian food suit the current interests in healthy eating (high fibre content, less sugar, meat and dairy products) and the desire to experiment with different tastes, including different spices and sauces.

More food and spices of ethnic origin are now available in the West and these are increasingly being supplied fresh. The large scale migration of ethnic peoples has also transferred culinary knowledge and skill, often together with the necessary capital to start up new businesses.

In Great Britain, there were almost 4,000 Chinese restaurants (including take-away food

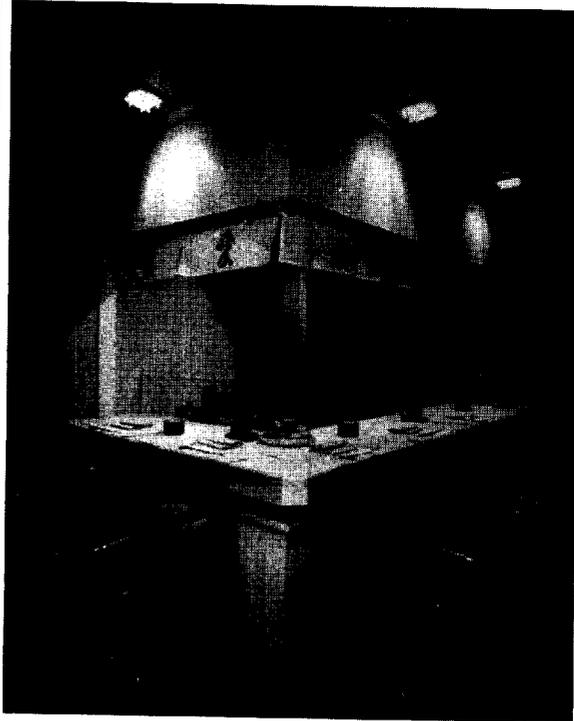
units) and nearly 2,000 Indian/Pakistani restaurants in 1984, representing 12.5 per cent of all the restaurants, cafés, snack-bars and take-away premises in the country. After fast-food operations and cafés, the two most numerous types of restaurants in the United States in 1982 were Mexican (10,900) and Oriental restaurants (9,900). Japanese-style operations such as sushi bars are also expanding rapidly all over the world.

3.02 Role of design

In ethnic restaurants the atmosphere created by foreign designs, aromas and background music is often as interesting as the food itself. Product differentiation such as in the type of food presented is important, as is the atmosphere which contributes to the experience. Ethnic food and design characteristics require careful research not only into traditional practices but to determine the conceptions and images potential customers have of such premises.

For popular ethnic restaurants the design features are often symbolic rather than authentic and may be exaggerated for greater effect. In more sophisticated establishments ethnic designs usually need to be much more subtle, emphasising classical rather than traditional rustic features.

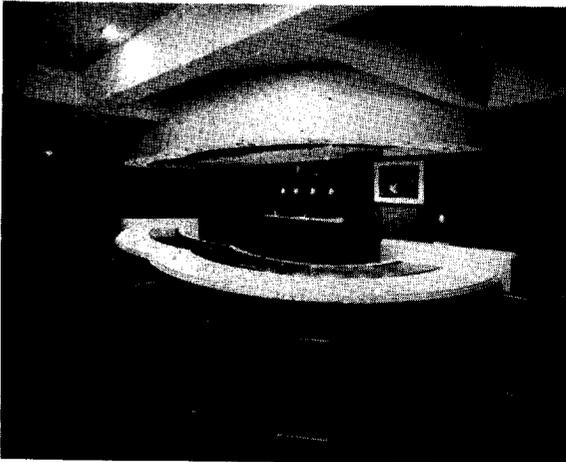
- In all cases, the following principles apply:
- mixing of styles must be avoided,
 - interiors should complement rather than dominate the experience,
 - a human scale must be maintained with sensitivity for personal interests (separation of space, intimacy of lighting, social groups),
 - touches of authentic artwork, furniture and effects should be introduced, preferably with emphasis on small accents of character,
 - features may include etchings, lithographs, screen prints, contemporary and traditional paintings, utensils, craftwork (in wall hangings, textured work, decorations),
 - the design, type of food and style of service must be carefully integrated into a deliberate theme,
 - showmanship may be provided where appropriate, as in displays of preparatory skills and cooking equipment,
 - uniforms are an essential part of the overall design and background music (traditional) is usually important for ambience in leisure dining,
 - concentration of aromas (spices, herbs, food flavours) may need to be carefully controlled and air-conditioning is normally required.
- To provide broad guidelines for design interpretation the following sections outline the main characteristics of the food and features of design commonly used in ethnic restaurants in Europe and the United States. These are intended only as general examples and there are many variations in style as in levels of sophistication.
- For further information of food traditions and



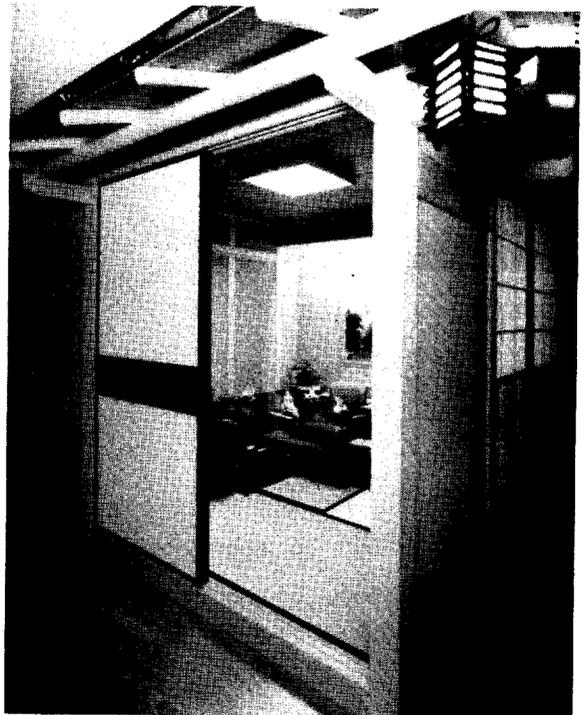
(a)



(b)



(c)



(d)

Aye Japanese Restaurant, Edinburgh

Designed by Japanese architects using materials and construction shipped from Japan, the Aye ('love') Restaurant specialises in Japanese cuisine. Separate rooms are provided for the tempura bar (a), sushi bar (b), teppan yaki bar (c) and the tranquil setting of the Japanese tatami room (d).

Client: Royal Liquor and Food Co. (Japan) Ltd
Photographs: Whitehouse Studios

national dishes, reference should be made to more specialist books such as in *Practical Professional Gastronomy*,³ *International Pocket Food Guide*⁴ and *The Good Food Guide*.⁵

Although ethnic foods are necessarily based on traditional recipes and ingredients, some tempering of the hot spicy foods is usually necessary to suit Western palates; a choice of Western dishes is almost always offered as well.

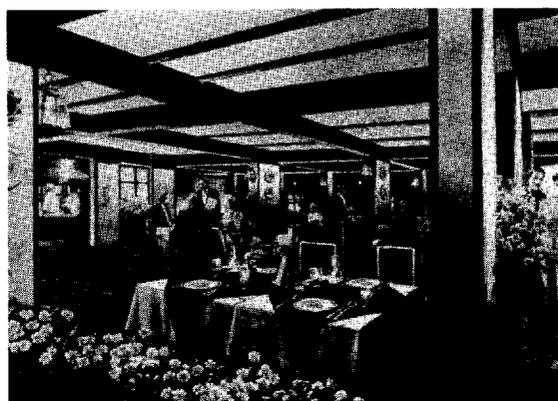
3.03 Chinese

From its earliest development the use of fine porcelain ('china') and metalware has had an influence on the style of food service in China.

Traditionally, meals for entertainment at home, as in restaurants, consist of a large number of individual dishes – at least five and often up to 12 or more. A careful balance between the opposing forces of the universe, *yin* (cold, gentle, negative) and *yang* (hot, aggressive, positive) is expressed by varying the composition of the dishes in order to ensure good health. Thus the same meal is likely to contain fish or shellfish (*yin*) and red meat (*yang*), rice and vegetables and cold and hot foods, all prepared by different methods to provide a harmony of colour, texture, flavour and variety. Five flavours corresponding to the five elements are also balanced – sweet, sour, bitter, salty and spicy-hot⁶.

There are four distinct regional cuisines reflecting the wide climatic variations:

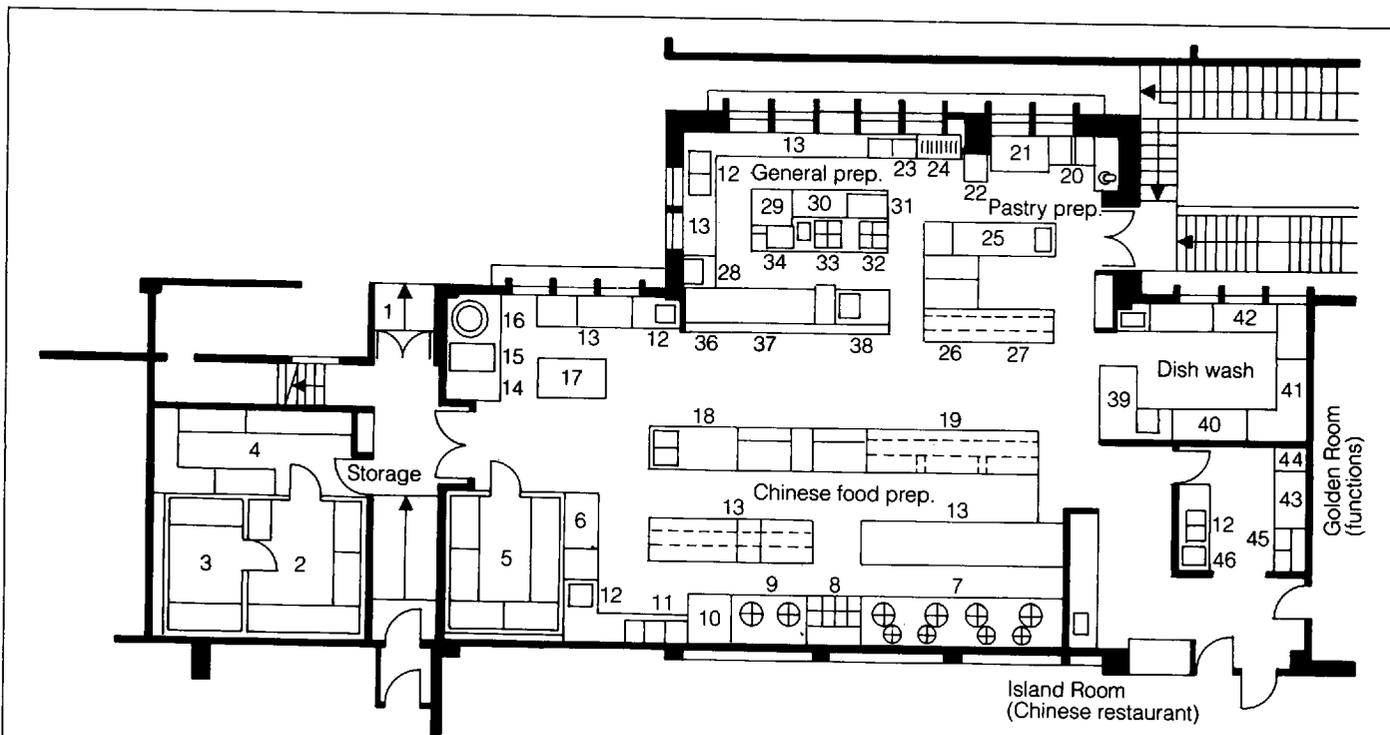
- *Canton*: the most varied range of food including sweet and sour dishes, meat balls, steamed fish, stir fried seafoods, deep fried chicken, pork dishes and snack foods like *dim sum* (filled dumplings). The majority of restaurants outside China are Cantonese,
- *Peking*: well-known dishes include duck and lamb. Greater use is made of farinaceous foods (noodles, dumplings, pancakes) and sweets,
- *Szechwan*: generally best known for hot, spicy foods including wood smoked duck,
- *Shanghai*: mainly fish and braised meat dishes with rice.



Holiday Inn, Kuching
The Meisan Szechuan Chinese Restaurant, Serapi Restaurant and Rajan Bar.

Design features	Food preparation and service
High-class restaurants are usually ornate with black lacquered woodwork, deep red carpets and upholstery, elaborate gold chrysanthemum and dragon designs, richly decorative	Menus are usually extensive (up to 300 items) and well established Equipment includes deep fryers, boiling hobs (for stir fry woks and pans), steamers, ovens, bains-marie

A number of the leading design consultants, including Dale Keller, have offices in Hong Kong



Service circulations

Storage area

- 1 Goods entrance
- 2 Walk-in cooler-freezer
- 3 Deep freeze section
- 4 Store
- 5 Walk-in cooler
- 6 Cabinet refrigerators

Chinese food preparation area

- 7 Chinese cooking range
- 8 Boiling top/oven range
- 9 Chinese food steamer
- 10 Steaming cabinet

- 11 Stock pot stands
- 12 Sink
- 13 Worktable with under-counter cabinet, refrigerator and cupboards
- 14 Shelf rack
- 15 Pig roaster
- 16 Duck roaster
- 17 Mobile table
- 18 Fish preparation table
- 19 Hot cupboards with infra-red lamps over counter

Pastry preparation area

- 20 Mixer
- 21 Baking oven
- 22 Mobile racks
- 23 Pot rack

- 24 Potwash sinks
- 25 Marble worktop with under-counter refrigerator
- 26 Worktop cabinet
- 27 Worktop refrigerator

General preparation area

- 28 Wall mounted salamander/grill
- 29 Roasting convection oven
- 30 Worktable with racks
- 31 Stockpot stove
- 32 Open flame cooking range

- 33 Bain-marie
- 34 Griddle
- 35 Fryer
- 36 Roll warmer
- 37 Serving counter with hot cupboards
- 38 Bain-marie counter

Dishwashing area

- 39 Soiled dish landing area
- 40 Dishwasher
- 41 Clean dish landing table
- 42 Clean dish racks

Wine dispense bar

- 43 Worktop refrigerator
- 44 Wine cooler
- 45 Bottle cooler
- 46 Ice storage bin

Hong Kong Country Club

Complete renovation of the Hong Kong Country Club kitchens was carried out in three months to December 1985. The facilities, shown in outline, are designed for Chinese food production with secondary production of European food for banquets and special functions.

Consultants: Clubs and Consultancy Services. The Peninsular Group
 Architects: Prescott and Partners, Hong Kong
 Clients: Hong Kong Country Club

screens and lanterns	and hot cupboards. Extensive preparation areas and storage are required
In others, atmosphere may be created by canework, ornaments, wall-hung screens and brightly coloured lanterns.	Family service variations: Dishes may be served in succession (appetiser, rice, main dishes, soup) or food may be individually selected from a tray and heated in a central container on the table. Dim sum may be served from trolleys or trays
Music is provided for atmosphere, and stylised uniforms should be worn, such as 'cheongsam' for waitresses	
Banquette seating may be used with screened areas but tables should be movable for banquet grouping. Place settings usually include long-stemmed glasses, napkins, chopsticks and spoons.	

3.04 Japanese

In Japan, eating out is part of the tradition of hospitality and with the increase in tourism and the growth of trade, Japanese restaurants are spreading to other countries. Japanese food and the classical methods of preparation have not been particularly affected by external influences. Food presentation and service are seen as art forms, involving careful blending of subtle flavours, colours and textures and the use of delicate carved, sliced or moulded shapes. Traditional foods are fish, seafood, short-grained rice and vegetables, including mushrooms and soya beans (also used for flavouring). Food is served at the table in a succession of dishes each prepared in a different way. The menu usually includes appetisers (*sashimi*), soup, grilled, steamed and fried dishes, rice, pickled vegetables, thick soup, carved fruit.

Food is seasonally selected for freshness and flavour and common dishes include *sashimi* (raw fish, finely cut, served with soy sauce and wasabi), *sushi* (rice dressed with fish or rolled in seaweed) and *tempura* (fish, prawns, vegetables, deep fried in batter). Restaurants or counters may specialise in particular styles of cooking, hence the growth in popularity of sushi bars.

Grilled dishes include *yakitori*; in winter, casserole dishes such as *sukiyaki* may be cooked at the table. *Sake* (rice wine) is traditional but whisky, wine and beer are also popular.

Design features	Food preparation and service
Traditional Japanese meals are taken kneeling at low tables on	Menus consist of a succession of small dishes, prepared in different ways and

mats and wood floor. Covered floor recesses may be used to form Western-type seats	harmonious in size, shape and colour
Eating rooms are plain and uncluttered, with low black or natural polished wood tables, a soft, pale decor, diffused lighting and artistic wall hangings	Equipment: extensive refrigeration (including ice making) is required. Preparation surfaces are large, with inset hotplates for featured cooking. Standard equipment includes boiling, steaming and frying hobs, with grills and deep fryers. Chafing dishes and heaters may be required for table cooking (<i>sukiyaki</i>)
Private dining areas are usually separated by sliding screens	Many restaurants specialise in particular styles of cooking. Sushi bars are popular and provide eating counters and stools. Food, selected from glass counters, is prepared within view as part of the artistic presentation
Background features (water ponds, sand gardens, fountains) are often used with large picture windows	
Public restaurants usually provide Western-style tables and chairs, often in cubicles separated by decorative natural wood screens	
Atmosphere is created by the use of decoratively arranged foods, ritualised service and kimono-style uniforms	

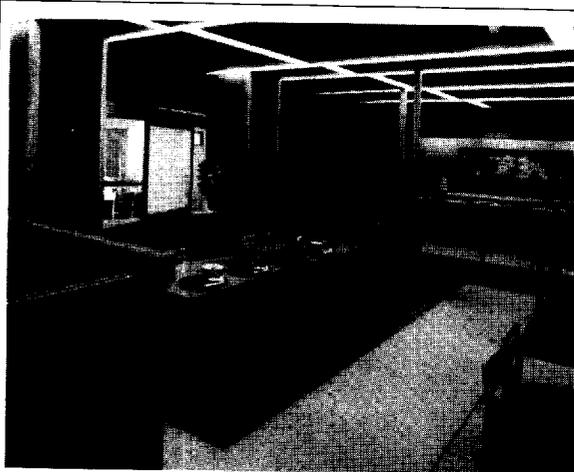
3.05 Indian

Indian cuisine provides a rich variety of food and spices and reflects the many different religions (Hindu, Islamic, Buddhist, Parsee) and external influences: (Moghul and Kashmiri in the north, Portuguese in Goa).

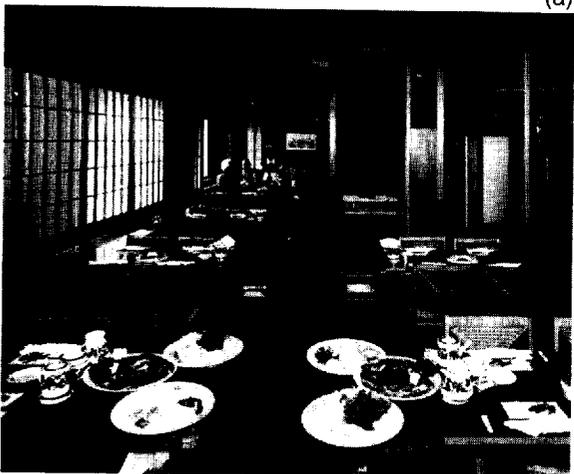
There are also wide regional variations in the types of food and blends of spices or curries used (Masala, Vindaloo, Tandoori, etc).

In the north, Moghul dishes include stuffed meats, *pilau* and *birianis*, *tandoori* cooked meats and grilled kebabs with many kinds of bread. Pork *vindaloo* originates from Goa. Southern dishes are often vegetarian or fish based. Yoghurt is widely used as both a drink and a cooking ingredient. Speciality restaurants may be based on the charcoal or wood roasting of marinated meats or chicken in the traditional tandoori oven.

Design features	Food preparation and service
Indian restaurants are usually characterised by their plush, elaborate decor with rich reds and	Menus are often elaborate with food carefully prepared by marinating, spicing, blending, stuffing, etc



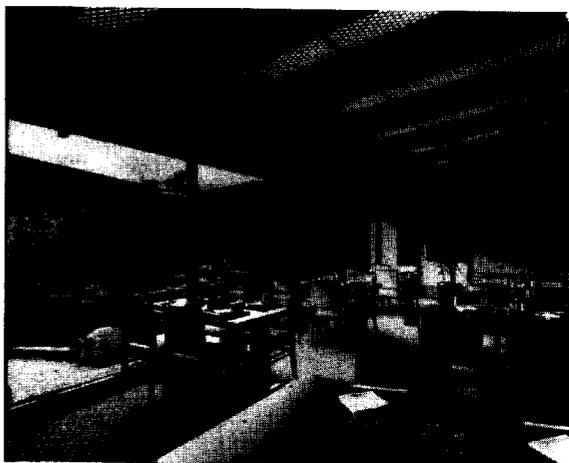
(a)



(b)

Miyako Hotel, Japan

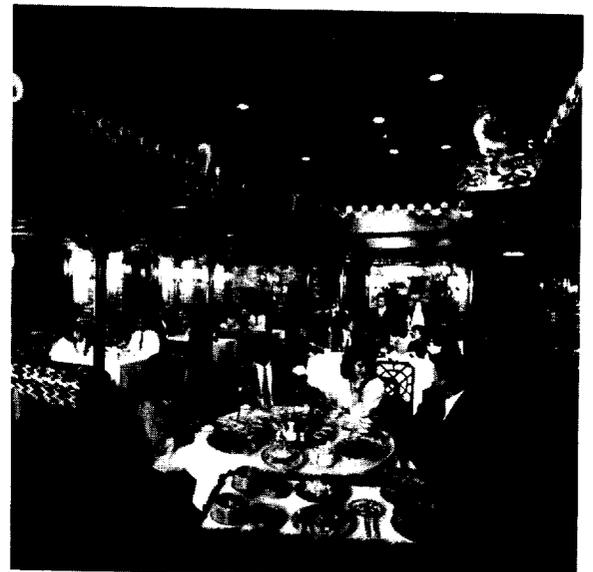
The new Miyako Hotel provides a choice of various cuisines featured in the seven restaurants and bars. These include a traditional sukiyaki room (a) and Japanese restaurant (b).



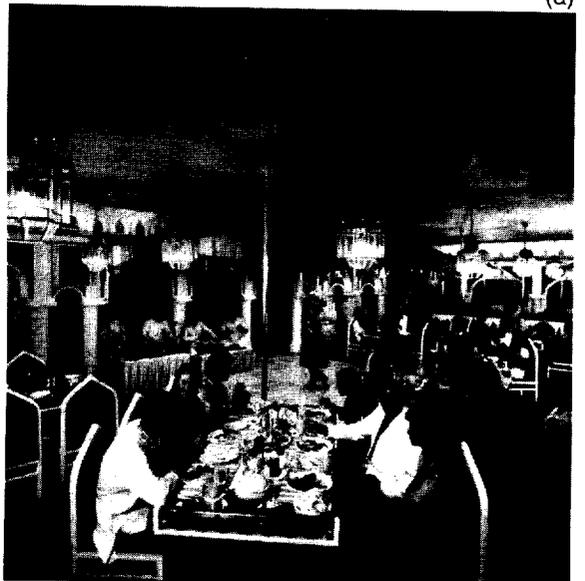
Asakusa View Hotel

Another example of a Japanese *à la carte* restaurant.

Architects and designers: Kanko Kikaku Sekkeisha. Y. Shibata and Associates



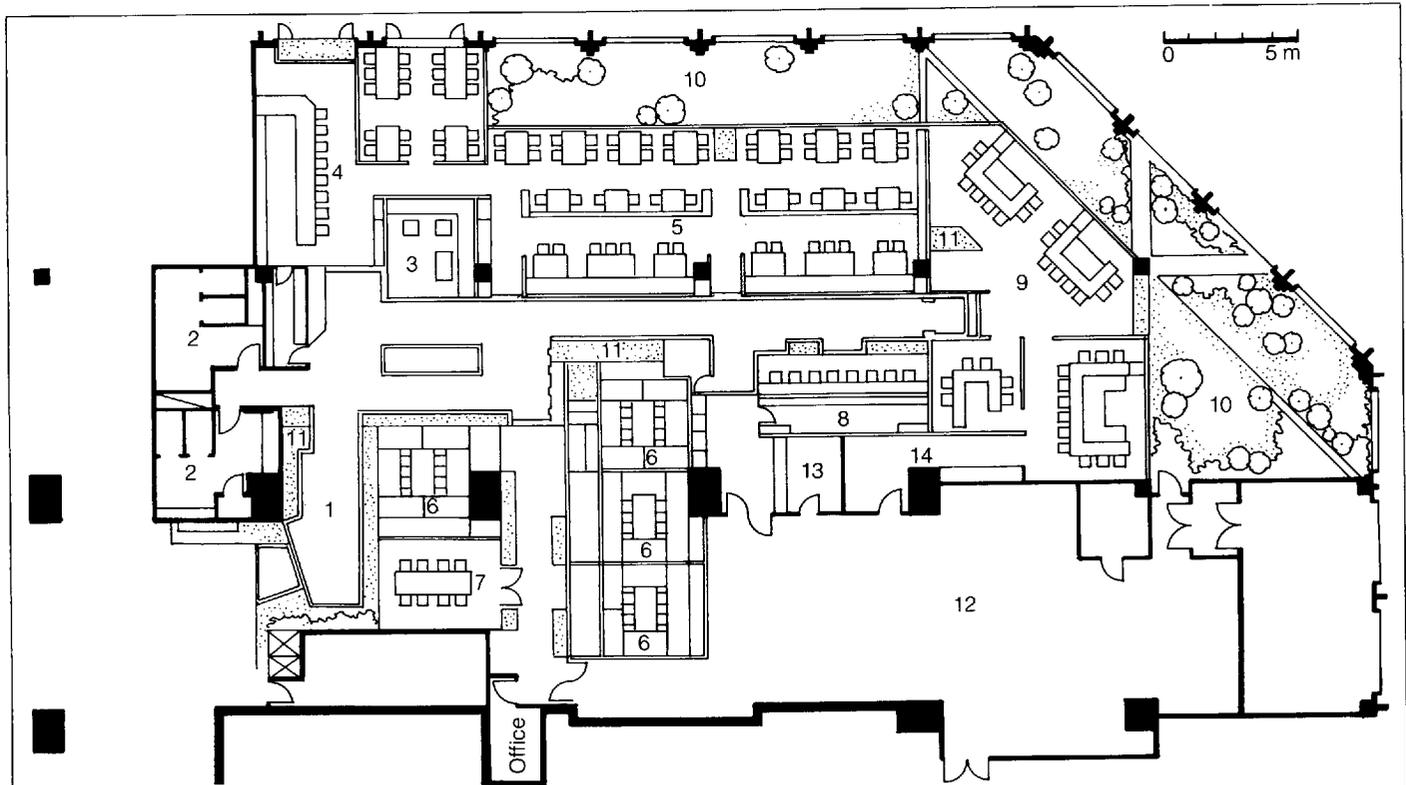
(a)



(b)

Ethnic restaurant design

Examples of the variety of restaurants in the Oberoi Group of hotels (a) Moghul Room, Oberoi Tower, Bombay (b) China Town Restaurant, Oberoi Imperial, Singapore

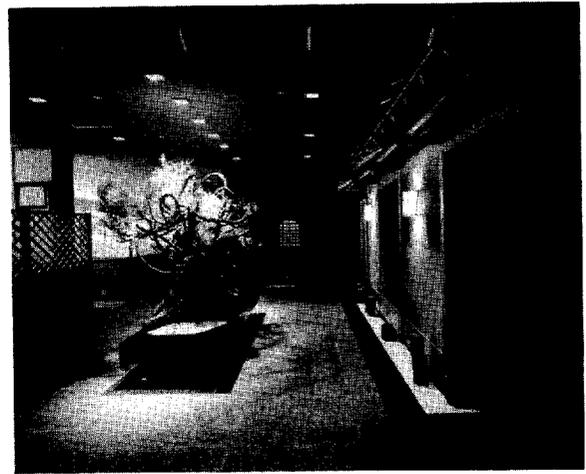


Shangri-La

- 1 Entrance hall
- 2 Toilets
- 3 Waiting bar
- 4 Sushi corner
- 5 *À la carte* restaurant
- 6 Tatami rooms
- 7 Private room
- 8 Tempura corner
- 9 Teppanyaki
- 10 Soft landscaping
- 11 Hard landscaping
- 12 Kitchen
- 13 Service bar
- 14 Pantry



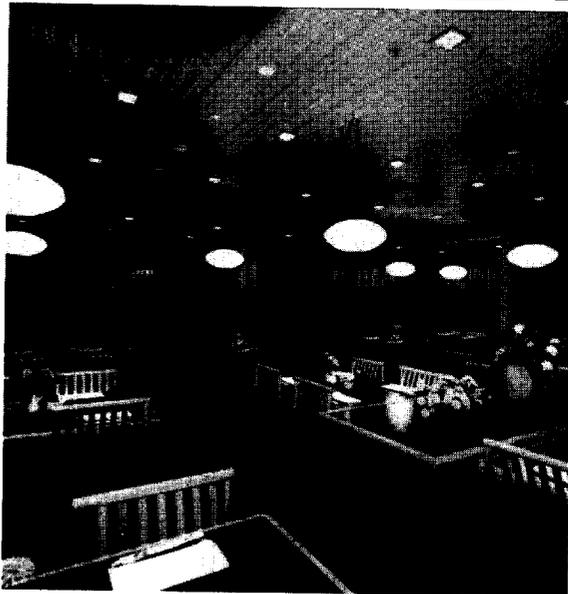
(a)



(b)

Shangri-La Hotel, Kuala Lumpur

Designed by Kanko Kikaku Sekkeisha, the Shangri-La restaurants include an *à la carte* restaurant (a), waiting area and bar, sushi bar, tempura counter, teppanyaki restaurant and tatami rooms. Traditional landscaping features provide an interesting backcloth (b).



Furama Hotel, Singapore

The Furama Hotel shows a typical Japanese restaurant arrangement. The *à la carte* restaurant also illustrates the quiet, unobtrusive design in warm, natural wood.

Architects and designers: Kanko Kikaku Sekkeisha. Y. Shibata and Associates

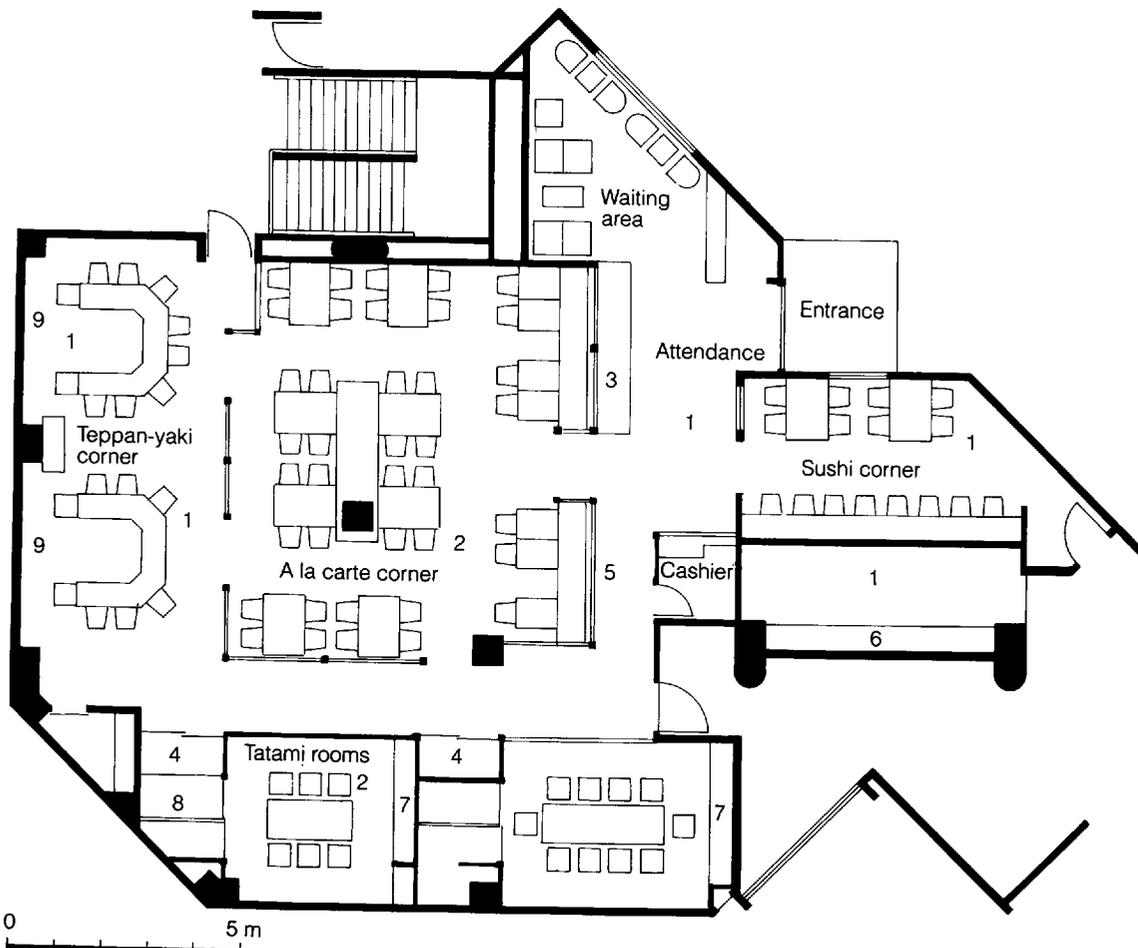
Constructional finishes and decoration

Floors

- 1 Porcelain tile
- 2 Carpet

Features

- 3 Rock garden
- 4 Pebbles
- 5 Screens
- 6 Japanese Zelkova – clear lacquer finish
- 7 Tokonoma
- 8 Japanese red pine
- 9 Wall ceramic tiles



browns contrasting with brass, copperwork and greenery. A sultry atmosphere may be induced by use of aromatic herbs and spices, soft, indirect lighting and gentle background sitar music. Chairs are often high backed and ornate and areas may be divided by ornamental screens and arches. In less formal establishments, relaxing, lighter colours may be used to contrast with the dark wood. Interest is created by prints, artifacts and featured cooking equipment (tandoori ovens)

Equipment: apart from the specialist tandoori oven and grill, cooking involves mainly simple boiling, steaming and deep frying equipment

Food service: meals are usually served in a variety of small dishes

pottery, wicker baskets and displays of wine bottles. In more sophisticated settings, the design may have a mythological or classical theme

3.06 Greek

Although Greek food shows some Turkish influence, and vice versa, many of the traditional dishes are unique to the country. The extensive coastline provides a wide variety of fish and seafoods (red and grey bass, squid, anchovies) and other national dishes include *afelia* (pork casserole in wine), *kleftiko* (braised lamb), *stifado* (casseroled beef, veal or chicken) as well as the universal *moussaka*. Extensive use is made of olive oil in cooking and dressing and seasonings include olives, herbs, yoghurt and lemon. *Taramasalata* (smoked roe paste) is used as a dip with pitta bread. *Hummus* purée and various *kebabs*, both also common to Turkey, are also widely used, as is Turkish coffee. Greek sweets such as *baklava* are also popular.

3.07 Italian

Italian food, especially pizza, enjoys international popularity. Pizza restaurants are the most numerous of all types of commercial food service establishments in the United States and the basis of many chain operations in Europe.

Because Italy was formed from a number of independent states, Italian cuisine exhibits wide regional differences and this is also reflected in the range of wines.

Pasta – usually freshly made and produced in various forms – provides the basis of many popular dishes. Cheese, tomatoes, garlic, anchovies and olive oil are common ingredients. Traditional dishes from the area around Rome include varieties of *pizza*, *lasagne*, *spaghetti* and *ravioli*. The Veneto makes extensive use of rice (*risotto*) and beans (*fagioli*) in minestrone soup and made up dishes. Well-known speciality dishes include cured meats, such as *salami* and *prosciutto*, *fegato* (calves' liver) and *osso bucco* (braised joints of veal).

Design features	Food preparation and service
Many Greek restaurants are designed as peasant-style tavernas, with white stucco walls, an open bar area and simple wooden furniture, which may be partly sectioned off. Flooring may be of decorative tiles, carpets or wood (for dancing)	Traditional dishes often use cheap meats extensively prepared and often cooked over a long period. Dishes may be served separately or as a meze. Standard kitchen equipment is usually installed but a rotisserie grill may be required for kebabs
For evening dining, table candles and decorative lanterns are common	Service is often lively, informal and traditional. Greek dancing may be featured
Atmosphere is created by wall paintings or posters, earthenware	Background or live music (balalaika) is often provided

Design features	Food preparation and service
Food service establishments range from high-class <i>ristoranti</i> , <i>trattorie</i> , to humble <i>tavernas</i> and <i>osterie</i>	In fast-food and bar counters the food range is strictly limited (mainly pizza) and production highly systematised, often based on centrally prepared food
Design: popular restaurants tend to express their rustic character and family atmosphere with white or pastel walls, small, round tables, red checked cloths, oven tableware, hanging baskets of greenery, wine displays and pictures	Trattoria menus are usually predictable and include many individual dishes (ovenware)
Trattorias usually project a smarter though bustling and informal image. Seating may be separated into alcoves and darker contrasting woodwork is often used	Facilities for pasta preparation and special pizza ovens are necessary, in addition to standard kitchen equipment
Restaurants: sophisticated Italian restaurants are often designed on classical lines with ex-	tensive use of mirrors and lighting for spaciousness and elegance

3.08 Spanish

Spanish food is generally unsophisticated, relying more on a subtle blending of flavours. Moorish and gipsy influence is seen in many of the dishes as well as in the artistry of design and music. Seafoods (including shellfish, crayfish, octopus, monkfish) are widely used by themselves and mixed with other ingredients in traditional dishes like *paella*.

Spanish omelettes (*tortilla*), cold *gazpacho* soup and cured Serrano ham are internationally known. Bread provides the main staple food although a pilaff of rice or beans is used in some dishes. Fresh fruit is also served in most meals. Spain produces a wide regional variety of fortified and table wines, spirits and beers.

Design features	Food preparation and service
The styling of Spanish restaurants is usually characterised by the ornamentation of the furniture and woodwork contrasting with plain walls. Decorative artwork may be displayed and incorporated into fittings such as lamps. Bottles of wine or displays of fruit may be used as arrangements	As a rule, the menu offers a variety of starters, a main meat or fish course and fruit, but single-course dishes may also be served. Food can be prepared with conventional cooking equipment but heavy iron <i>paella</i> frying pans are preferred

3.09 Mexican

Characteristically spicy and hot, Mexican food incorporates various kinds of chillies in many of the basic dishes as well as in piquant sauces and relishes. Mexican dishes and methods of cooking have their origins in the Spanish, Mayan and Negro cultures and have had a growing influence on the Southern states of America.

Maize or sweet corn dough (in *tortillas*) and various kinds of beans are the staple foods and tomatoes, onions, cheese and vegetables such as avocado are widely used in fillings and dips (*guacomole* from avocados). Many of the speciality dishes are based on filled *tortillas* (*tacos*, *burritos*) and these have been developed in fast-food operations. Other popular dishes include *chilli con carne*, *empanadas* (meat rissoles), and seafoods such as *abalone*. Mexican drinks include varieties of distilled spirits (*Tequila*) and beers.

Design features	Food preparation and service
Mexican food, such as <i>tacos</i> , lends itself to	Food preparation and cooking is often simple.

systematised fast-food operations, being relatively inexpensive and easily adapted for counter-style service. In other Mexican restaurants, atmosphere is often introduced by hacienda-style designs and representative features such as displayed handicrafts, exposed wood tables, rawhide and mesquite chairs, decorative mats, wall-hung ponchos and sombreros

Most of the traditional meals use meat sparingly. Many of the composite dishes are hotly spiced and may need to be modified (as in Tex-Mex food) for other palates

3.10 Scandinavian

Swedish, Norwegian and Finnish dishes are probably best known for their wide variety of fresh, marinated or smoked fish and cold meats. *Smorgasbord* buffets with an array of hot and cold dishes of fish and meats are a luncheon speciality. In other meals the main course is usually based on meat, often flavoured with fruit or spiced sauces.

Design features	Food preparation and service
Scandinavian designs are usually recognisable by their clean, neat lines and simple, stylish decor. Much use is made of light woodwork. Stainless steel features widely in display equipment, utensils and fittings	Standards of hygiene are generally high in both production and service areas. Extensive refrigeration is required for storage and counter display

4. Hotels, clubs and leisure centres

4.01 Hotels

Food service facility requirements in hotels are determined by:

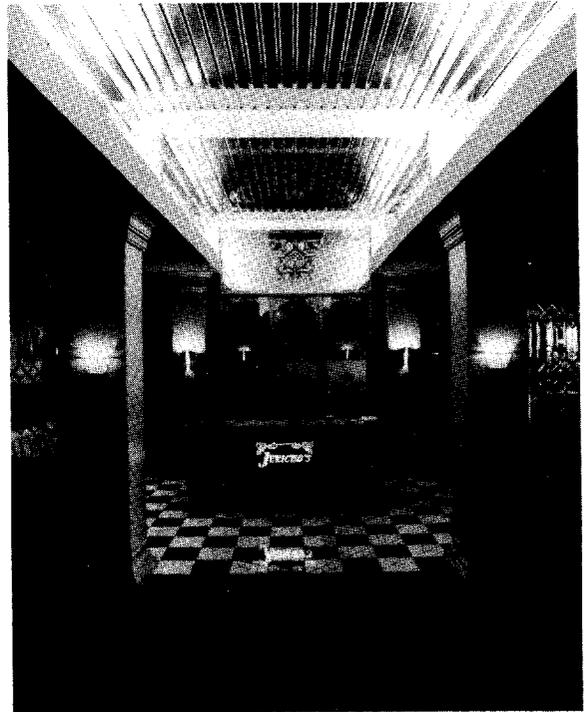
- location: availability of restaurants in area,
- grade: standards required for classification and prices,
- tour organisation: packaging arrangements inclusive of meals,
- markets: local markets for functions and restaurants.

The commercial feasibility of hotel restaurants in urban areas is often dependent on non-residential business. Analysis of the local market opportunities and constraints must form part of the planning process.

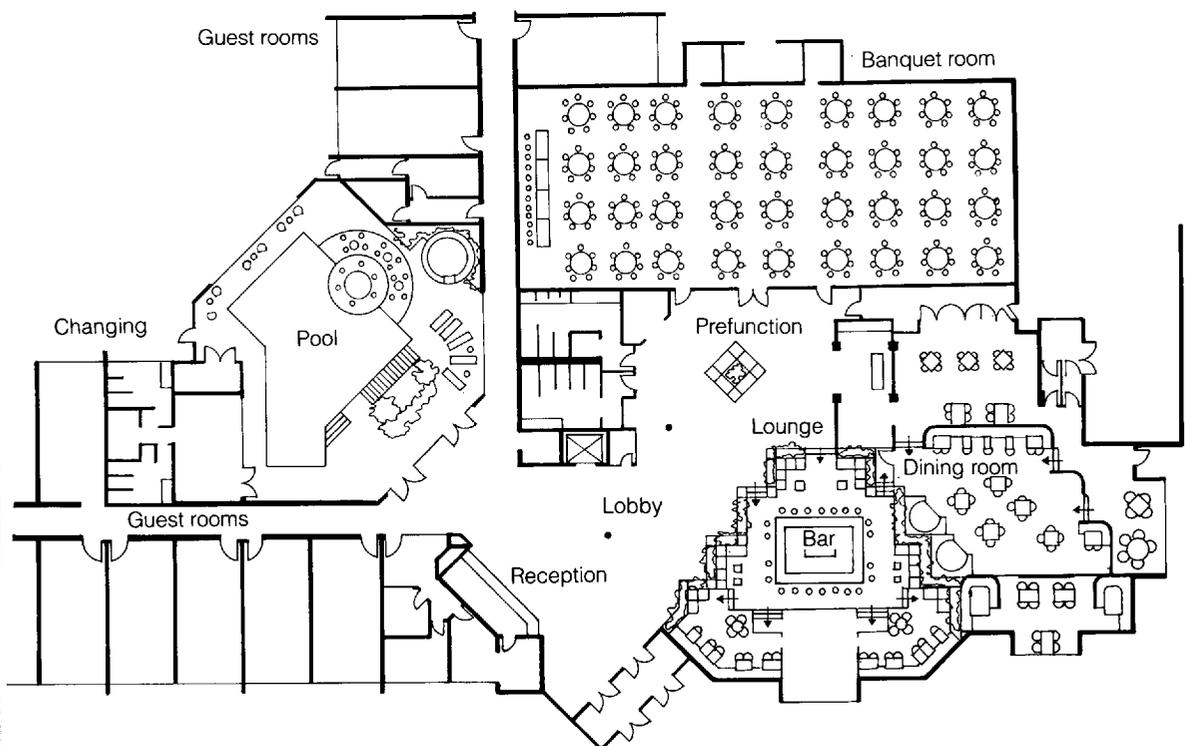
In high-grade hotels a choice of main or speciality restaurant and coffee shop is usually provided. In budget hotels the restaurant may be reduced or omitted for economy or operated



(a)



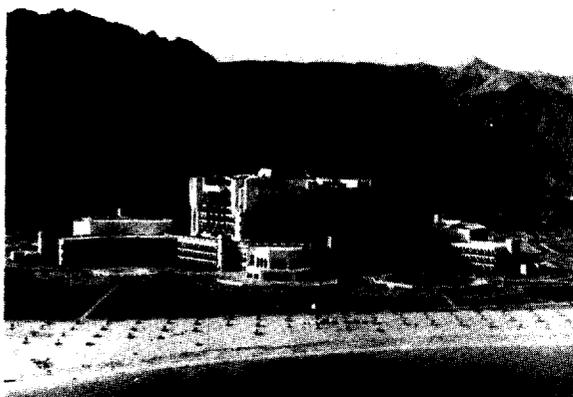
(b)



Howard Johnson Superlodge, Fayetteville, North Carolina

Opened in April 1985 this is a full service hotel consisting of a lobby, banquet rooms, pre-function area (a), dining room – Jericho's (b), spa-pool area with an exercise room and 152 guest rooms.

Designers: Hotel-Restaurant Planners, a division of Professional Interiors Ltd
 Client: Ralph Williams Enterprises



(a)



(b)



(c)



(d)

Al Bustan Palace Hotel, Oman

One of the most spectacular hotels in the Middle East, the £130 million (\$200 million) Al Bustan Palace incorporates eight palaces, an international congress and cultural centre and a luxury hotel with over 200 rooms (a). The Islamic inspired design incorporates a massive golden dome over a central octagonal atrium. Arabesque and filigree decoration blend with elegant furnishings.

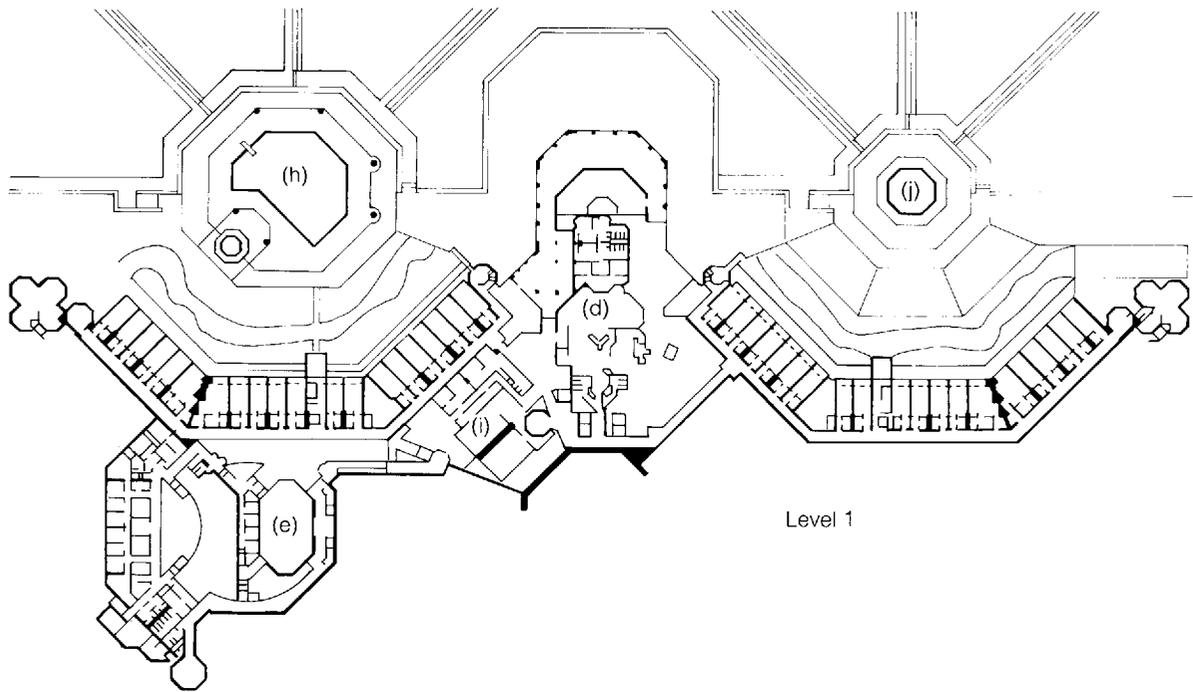
The complex offers a wide choice of restaurants: the mosaic ornamented Al Bustan café open from early morning to midnight (b), the Al Marjan *à la carte* restaurant, the Al Maha lounge (c), the Al Sindbad club (d), and no fewer than 17 banqueting and reception rooms (e) catering for over 1,000 people.

Opened in 1985 for the Gulf Cooperation Council Summit, the construction was completed in a record two years by builders J. and P. (Oman), the project being managed and coordinated by Scottish architects Valtos.



(e)

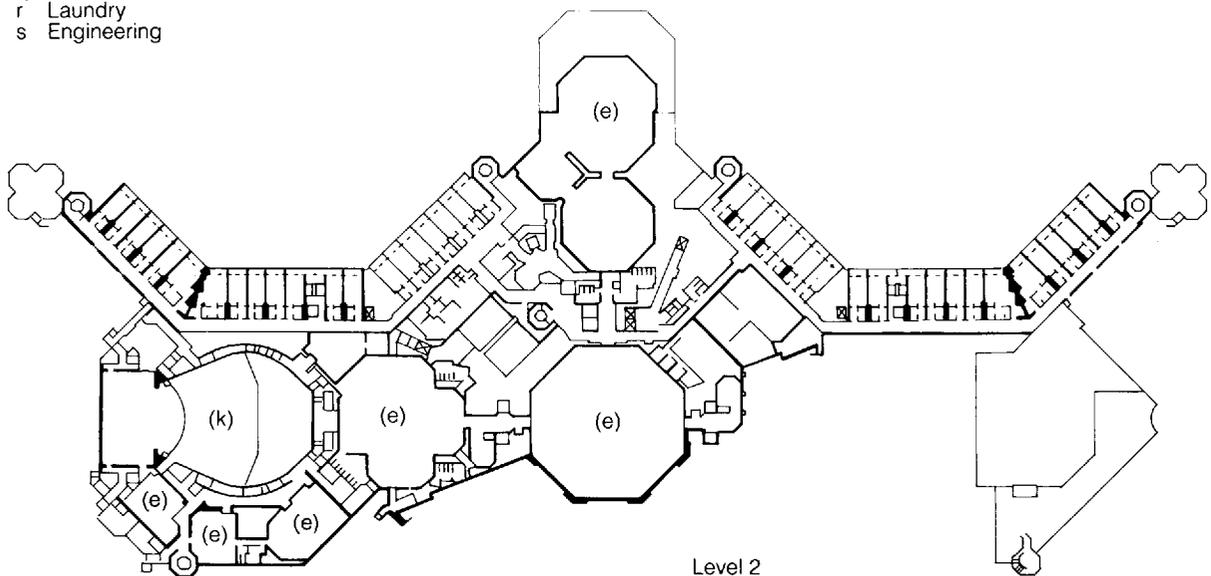
Architects: J. and A. Philippou
 Interior designers: Société Pierre Yves Rochon
 Clients: His Majesty Sultan Qaboos
 Operation: Inter-Continental Hotels



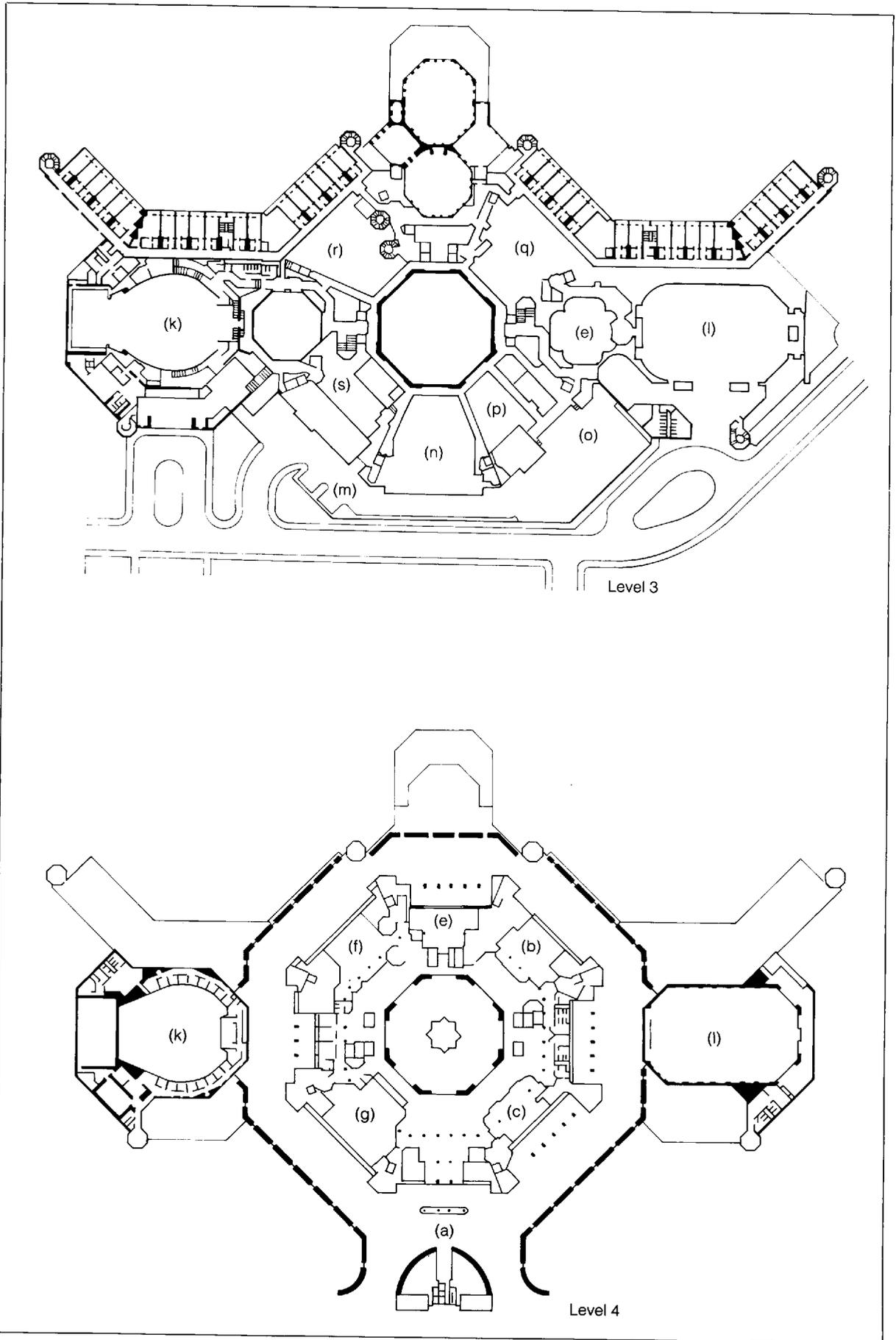
Level 1

Key

- a Main entrance
- b Al Bustan café
- c Al Maha lounge
- d Al Sindbad club
- e Banqueting and reception area
- f Al Marjan restaurant
- g Hotel reception (level 4)
- h Swimming pool
- i Health club
- j Open air theatre
- k Oman auditorium (level 3)
- l Majan ballroom (level 3)
- m Staff entrance (level 3)
- n Staff facilities
- o Loading bay
- p Storage
- q Main kitchen
- r Laundry
- s Engineering



Level 2



independently.

4.02 Food and beverage operations

The distribution of food and beverage sales in typical high grade hotels can be represented as follows:

Facility	Percentage of total food sales %	Percentage of total beverage sales %	Meals: covers/seat %
Dining room	60-67	25-31	450-650
Room service	6-10	5-9	-
Banquet(a)	21-23(a)	10-22	60-75(a)
Bar and lounge	2-3	42-47	-

(a) Most widely variable. Generally higher in the United States.

Ratios to total sales	Europe %	N. America %	Asia %	Africa %
Composition of sales				
Rooms	50.4	57.9	47.9	45.8
Food	28.7	24.6	30.9	28.7
Beverages	14.3	11.1	11.0	11.1
Other	6.6	6.4	10.2	14.4
Food and Beverages				
Sales ratio				
Food	66.7	70.9	73.7	69.2
Beverages	33.3	29.1	26.3	30.9
TOTAL	100.0	100.0	100.0	100.0
Cost of sales				
Food	34.7	35.1	34.8	35.2
Beverages	29.1	25.4	22.4	25.6
TOTAL	33.9	32.3	30.8	32.3
Gross profit				
Food, beverages	66.1	67.7	69.2	67.7
Other income	3.7	3.5	2.2	2.5
TOTAL	70.1	71.4	71.5	69.9
Departmental expenses				
Payroll and related expenses	41.7	42.2	30.2	31.4
Other	7.5	11.8	13.5	13.2
TOTAL	50.1	54.5	43.5	43.5
Departmental income				
Ratio to total sales	21.5	15.1	25.5	26.5
	8.5	5.2	9.7	10.3

All figures are medians and do not necessarily add to the totals shown. Based on *Worldwide Lodging Industry*, 1985, Horwath and Horwath International.

In high grade hotels the numbers of full-time equivalent employees in food and beverage departments vary widely depending on employment costs and standards of training.

Full-time equivalent employees	N. America	Europe	Asia (a)	Africa (b)
Total numbers of employees/100 rooms				
In food and beverage department	68	76	135	111
Percentage of total	36	37	61	47
	53%	49%	45%	42%
Productivity index (Food/Beverage sales) Employee costs				
	2.0	2.2	4.6	3.0

(a) Asia and Australasia.

(b) Africa and Middle East.

Based on *Worldwide Lodging Industry*, 1985, Horwath and Horwath International.

4.03 Range of provision

<i>Restaurant type and hotel</i>	<i>Use and area</i>	<i>Design requirements</i>
<i>Main restaurant</i>		
Tourist hotels offering packaged holidays	Intensively used for all or most meals. Must facilitate fast standard service and easy cleaning of tables. Capacity must allow for peak seasonal use: typically 1.5–1.7 seats per room unless multiple sittings are arranged	Arranged to permit rapid service with maximum staff. Some flexibility in layout is necessary to allow different grouping of tables and chairs. Multi-purpose use for social gathering and entertainment may be specified
	<i>Area per seat</i>	
	Average 1.3–1.5 m ² (14–16 ft ²) Economy hotel (group seating) 0.9–1.1 m ² (10–12 ft ²)	A bright, exaggerated decor with emphasis on local character, features, styles and materials is usually required Easy cleaning, operation and maintenance is essential A dispense bar for alcoholic and soft drinks should be provided in addition to a separate bar and lounge
<i>Main restaurant</i>		
City hotels	Usually depends on the local market for a major part of midday and evening business. Capacity varies from 0.5–1.0 seats per room, for hotels of average grade	Must be convenient and conspicuous with second direct entry from street. Alternatively, may be located at roof level with direct elevator service from lobby
	<i>Area per seat</i>	
	Average 1.3–1.5 m ² (14–16 ft ²) Luxury 1.7–1.9 m ² (18–20 ft ²)	A traditional sophisticated, decor with emphasis on quality of food, service and surroundings is typical in high-grade hotels. For <i>haute cuisine</i> provision should be made for cooking at the table. Wine service facilities are necessary The environmental control should be of high quality
<i>Buttery bar or Coffee shop</i>		
City and staging hotels	Quick meal service usually with restricted choice of dishes, prepared to order by fast grilling, frying, and microwave heating. Menu appropriate for any meal time (with breakfast additions). Open long periods (often 24 hr). May have counter or/and table service. Typical provision: 0.5 seat/room. Counter seating may be up to 1/3 total	Individual stylised design with flexibility to allow for sub-division and variation in atmosphere at different times of day is usually specified. May include: Counter dining with purposely designed chairs or stools Booth or banquette seating with fixed tables Loose chairs and tables suitable for pairing and grouping The wall and floor surfaces may be of hard exposed materials but with parts carpeted and lined with softer materials for evening use
	<i>Area per seat</i>	
	Counters 1.7 m ² (18 ft ²) Tables 1.5 m ² (16 ft ²)	

Speciality restaurant, supper club, night club

(Depending on emphasis) city and convention/resort hotels

Based on speciality in food method of service or style of operation. Mainly used in evening but lunch time operation on reduced scale and with modified service and sophistication may be necessary. Provisions usually include:

Visible cooking on specially designed equipment, e.g. rotisserie, charcoal grill

Stage, bandstand or dancing area

Wide range of lighting variations including spotlights

Local sound systems and acoustic control.

Viability of a speciality restaurant depends on:

Market area: including other hotels

Competition in locality: usually limited to hotels of over 200 rooms. Seating capacity: 100 or more

Area per set (including small stage etc) 1.9 m² (20 ft²)

Specifically designed to complement the food and service. The decor is invariably sophisticated and themed, with many focal points of activity and interest. Personalised seating areas are necessary separated by individual lighting and/or by screens or balconies. The central area should be flexible in layout to allow:

Different groupings of tables

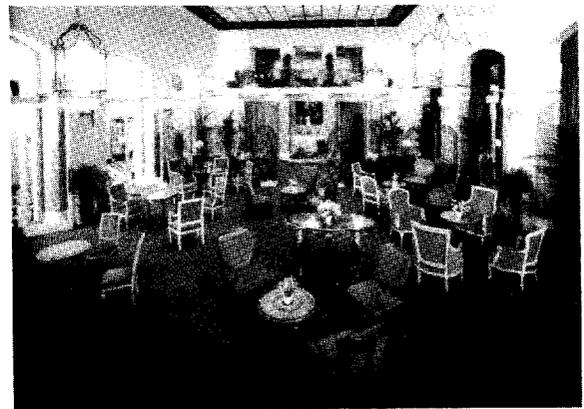
An area for dancing or entertainment visible to all areas

Where in-room cooking is required this should be a focal point of interest. Provision may be required for cooking at table. A cocktail lounge is usually required as well as wine service

Fittings, furniture and furnishings are of high quality and often to individual design



(a)

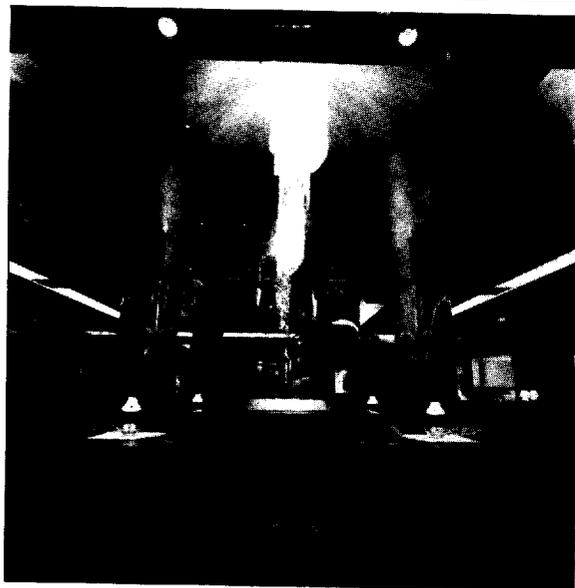


(b)

Hotel renovations, France

Lutetia Hotel, Paris

Built in 1910 on Paris's Left Bank, the Lutetia Hotel has been carefully renovated with the installation of air-conditioning and other improvements whilst still retaining its Art Nouveau/Art Deco decoration. In addition to the Brasserie Lutetia (150 places) designed by Slavic, a new gourmet restaurant, Paris (35 places) (a), has been opened which recreates the intimate atmosphere of a 1930s transatlantic liner. The original high ceilings, lalique chandeliers and wrought-iron balcony have been retained in the main salon (b).



(a)



(b)

Tokyo Hilton International

The Tokyo Hilton is a blend of Japanese and American styling as shown in the spectacular lobby (a) and grill room (b).

Architects and designers: Kanko Kikaku Sekkeisha, Yozo Shibata and Associates, Graham Solano Ltd

4.04 Clubs

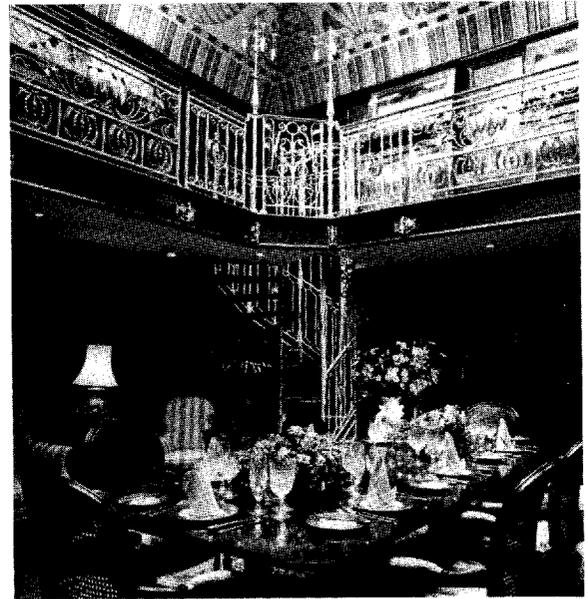
Clubs can be broadly grouped into *private members* clubs and *commercial* clubs.

Private members clubs are for pleasure, recreation and other non-profit making purposes. There were 34,200 registered members clubs in Great Britain in 1985⁷ and about 12,000 private members clubs in the United States.⁸ These include town clubs, country clubs, military clubs, masons' lodges, Working Mens' clubs (particular to Great Britain), company employee clubs and associations like the YMCA. Many fraternal and charitable service clubs and societies (such as the Round Table, Rotarians, Kiwanis) own no property but meet in local halls, hotels or restaurants.

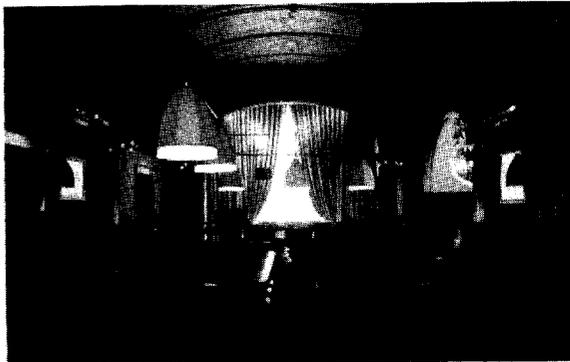
Commercial clubs are owned and operated by companies or individuals for profit. They include licensed gaming clubs, night clubs, health clubs and some recreation clubs.



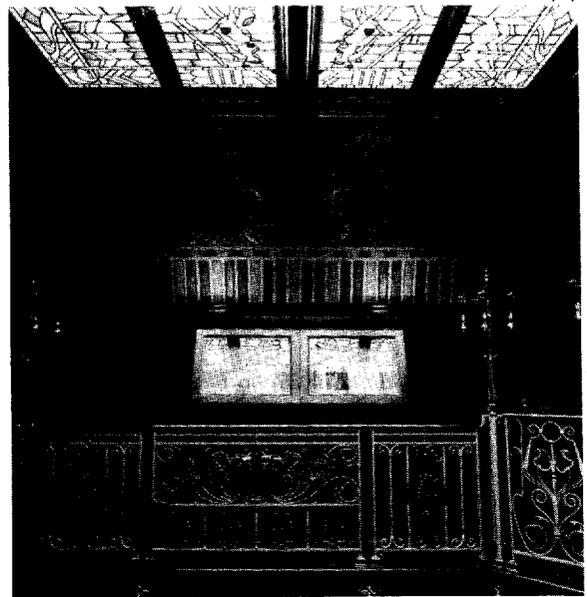
(a)



(b)



(c)



(d)

Private Club, London – *Salle privée* and private dining room
Completed in 1896, this building is a unique example of the Arts and Crafts movement and is Grade 1 listed (a).

Carmona Dover were briefed to convert these rooms as part of the overall refurbishment programme for the club, to provide a private dining room (b) and *salle privée* (c). The rooms have been restored to their original design, with all modern services carefully integrated and many of the original features have been reconstructed (d). The dining room is designed to cater for small, private parties, and is serviced from the second-floor kitchen, supported by the miniature finishing 'valet' kitchen adjacent.

The overall programme was carried out in two phases over a period of three years at a cost of £3.2 million.

4.05 Development

Club membership confers a number of advantages:

- non-profit-making clubs and associations may qualify for tax exemption under Inland Revenue or Internal Revenue Service rules,
- members have the exclusive use of high-cost club facilities at an affordable inclusive fee,
- social contact between members with similar interests is facilitated,
- clubs tend to get preferential treatment in seeking planning permissions, liquor licences and other concessions.

The range of members clubs has been expanding, with wider interests in leisure, health, travel and shared ownership of property (condominiums, time-sharing). Commercial provision of clubs has also been increasing. Many hotels have extended leisure facilities for residents open to club members at specific times as a means of offsetting capital costs.

4.06 Facilities

Facility provision depends on the nature, objectives and membership of the club. Most country clubs operate some form of leisure and sports facilities (golf, tennis, swimming, yachting, skiing). Club premises invariably include a bar, lounge and meeting facilities and many town clubs operate a restaurant. In some commercial establishments emphasis may be given to entertainment, dinner dancing and gambling.

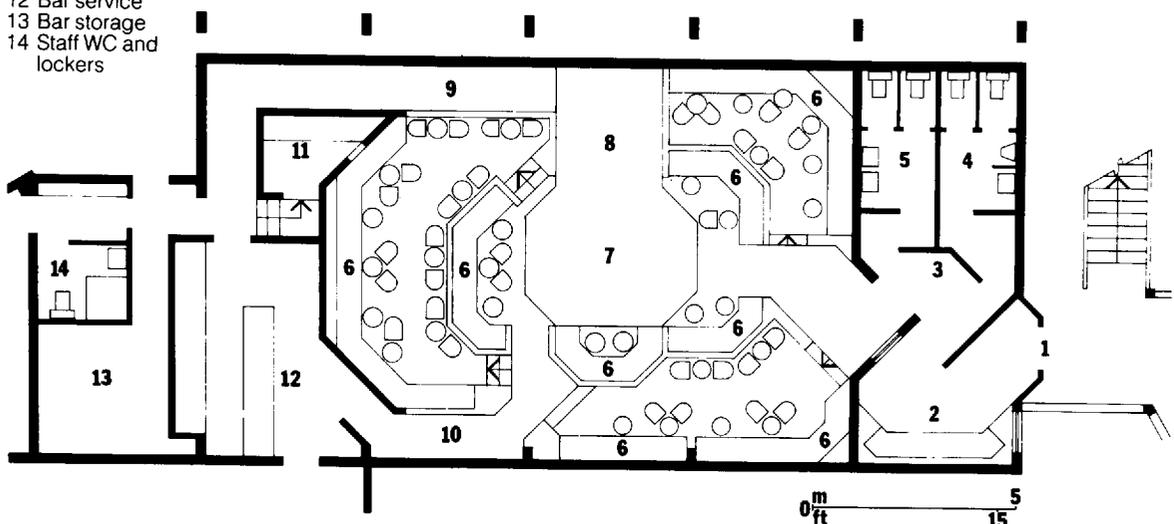
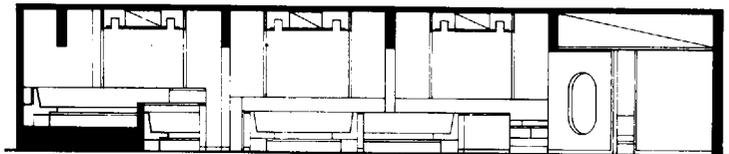
Facility planning and design follow much the same procedures as those for restaurants, bars and function rooms generally. The feasibility of investment in new or improved premises depends on the numbers and fees for club membership (financing the capital debt) in addition to income generated by sales.

Othon Palace Hotel, Bahia, Brazil

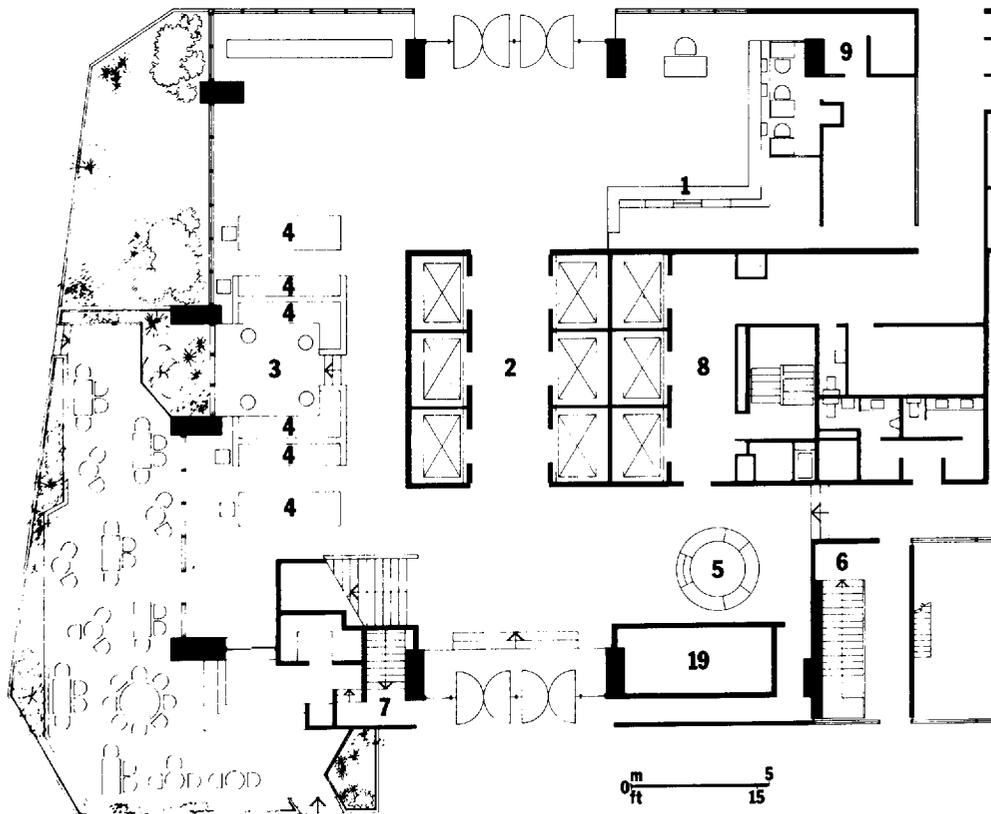
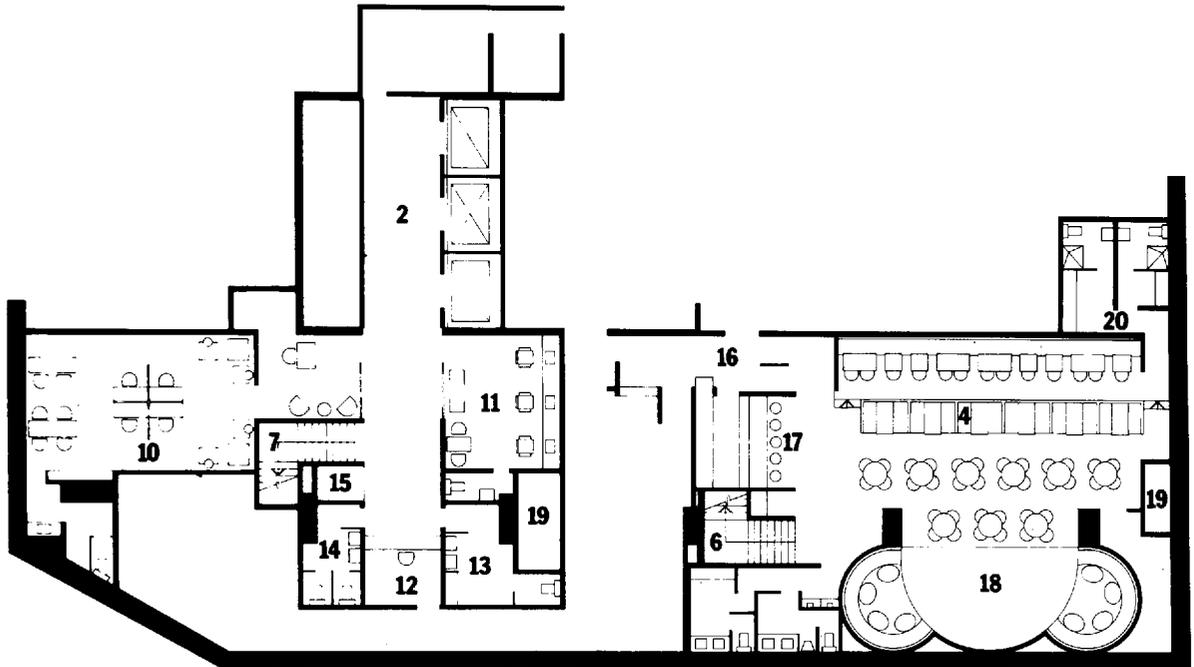
Plan and section of basement night club showing ceiling service ducts and banquette seating: section also shows how outer ring of seating is raised above floor level.

Clients: Othon Palace Hotels
Architects: Paulo Case, Luiz Acioli, L. A. Rengel
Interior designers: de Polo Associates

- 1 Entrance
- 2 Lobby
- 3 Reception
- 4 Male WC
- 5 Female WC
- 6 Banquettes
- 7 Dance floor
- 8 Band
- 9 Band aisle
- 10 Service aisle
- 11 Disco control and equipment
- 12 Bar service
- 13 Bar storage
- 14 Staff WC and lockers



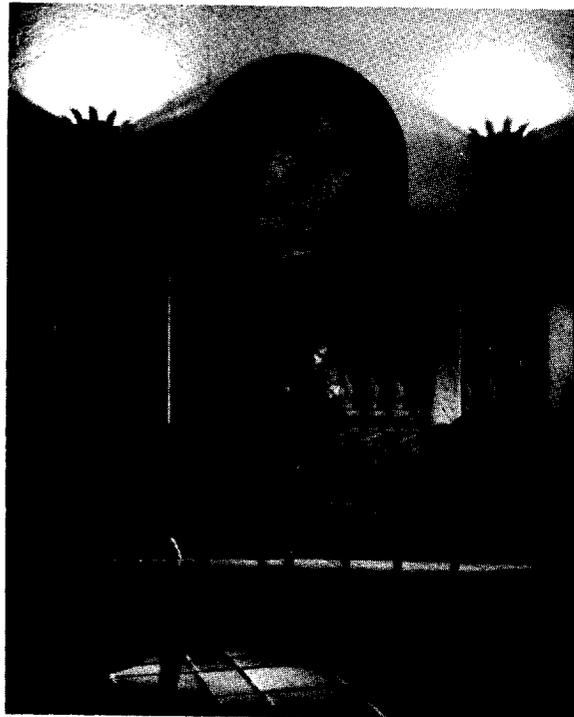
- 1 Front desk
- 2 Elevator hall
- 3 Lounge
- 4 Seating
- 5 Display
- 6 Night club entrance
- 7 Bathers' entrance
- 8 Service Lobby
- 9 Safe deposit
- 10 Beauty salon
- 11 Barber's shop
- 12 Control
- 13 Male WC
- 14 Female WC
- 15 Footbath
- 16 Vestibule
- 17 Bar
- 18 Stage/dance floor
- 19 Duct spaces
- 20 Staff WC and lockers



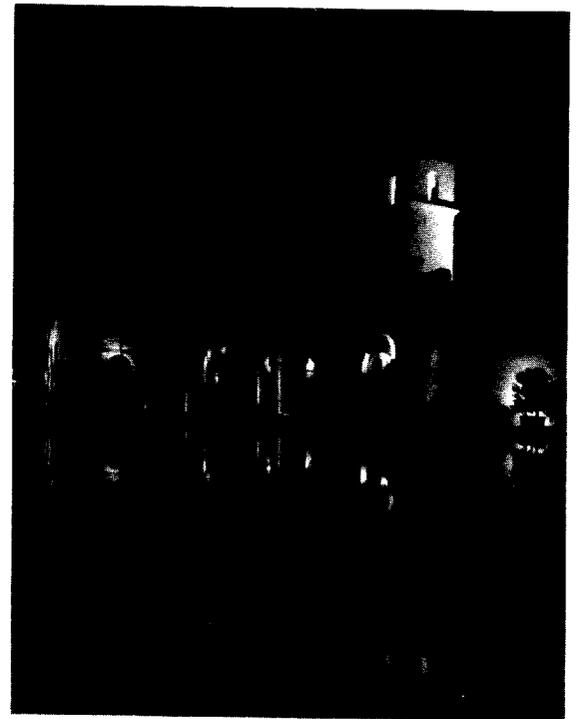
Othon Palace Hotel, Rio de Janeiro, Brazil
 Plan of the proposed entrance lobby, reception and lounge areas at street level. Guestrooms occupy the 5th and 28th floor of a tower block, typically 27 rooms on each floor, arranged round a central-circulation services core. Plans of night club and bar at 1st basement level. On the same floor are a barbers' shop and beauty parlour with a separate entrance for

bathers. The hotel includes a roof-top swimming pool on the 29th floor.

Clients: Othon Palace Hotels
 Architects: Pontual Associates
 Consulting architects: W B Tabler
 Interior designers: de Polo Associates



(a)



(b)



(c)



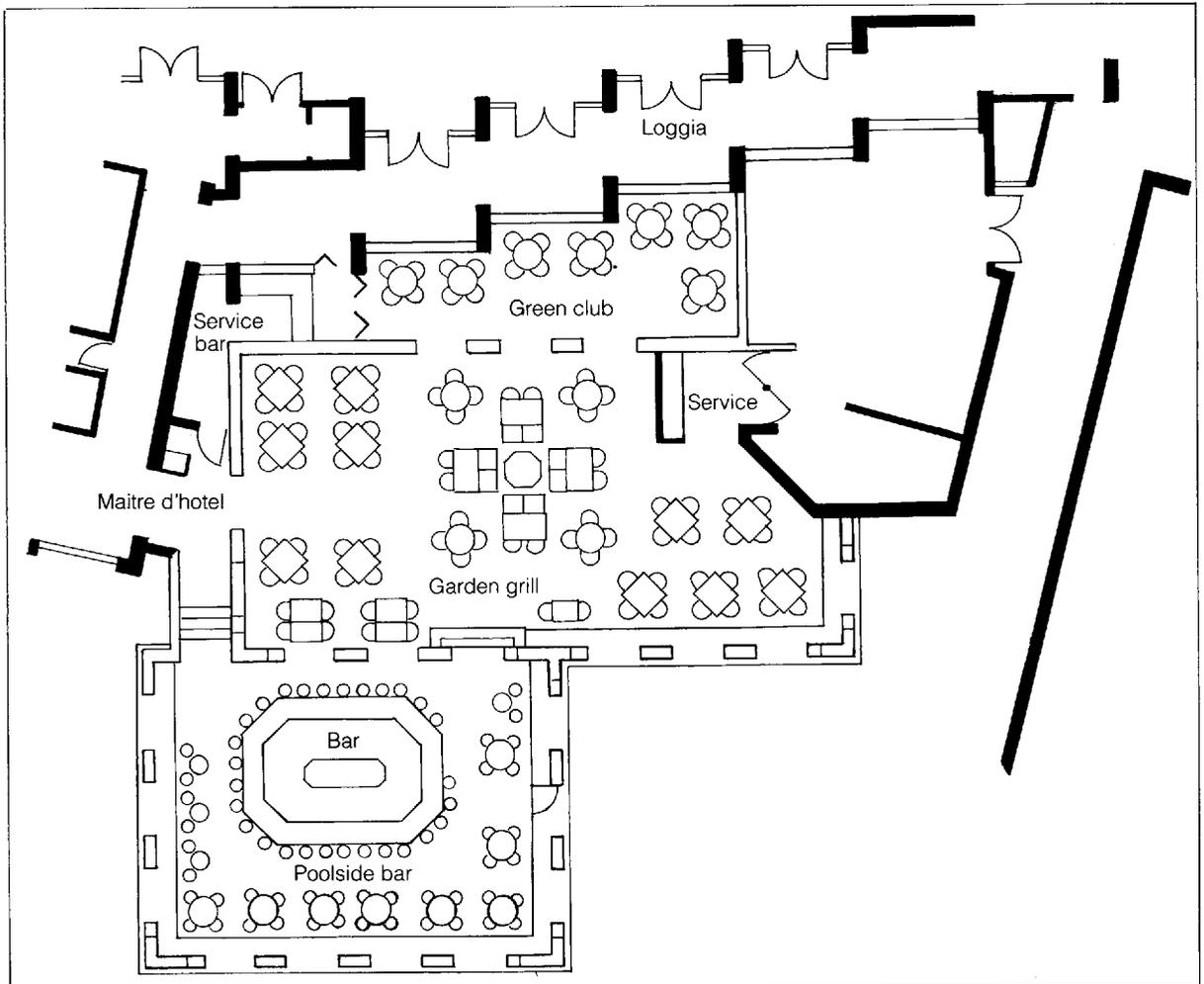
Country Club of Coral Gables, South Florida

A historic landmark, the Country Club of Coral Gables was destroyed by fire in 1983. This new building has been carefully designed by Lynn Wilson to integrate the ever-changing functions of the club with the original 1920 Mizner influence of the architecture. The latter is represented in Corinthian columns and arches, terracotta tile floors, Mediterranean colours and hand-carved furniture (a).

The bar, lounge, Garden Grill and Greenhouse restaurants are interlinked and overlook the pool to create a garden environment (b). All the furniture – including banquettes – is moveable to allow flexibility.

The bar is featured with custom hand-painted tiles and an illuminated etched glass panel (c).

Designers: Lynn Wilson Associates
Photographs: Dan Forer



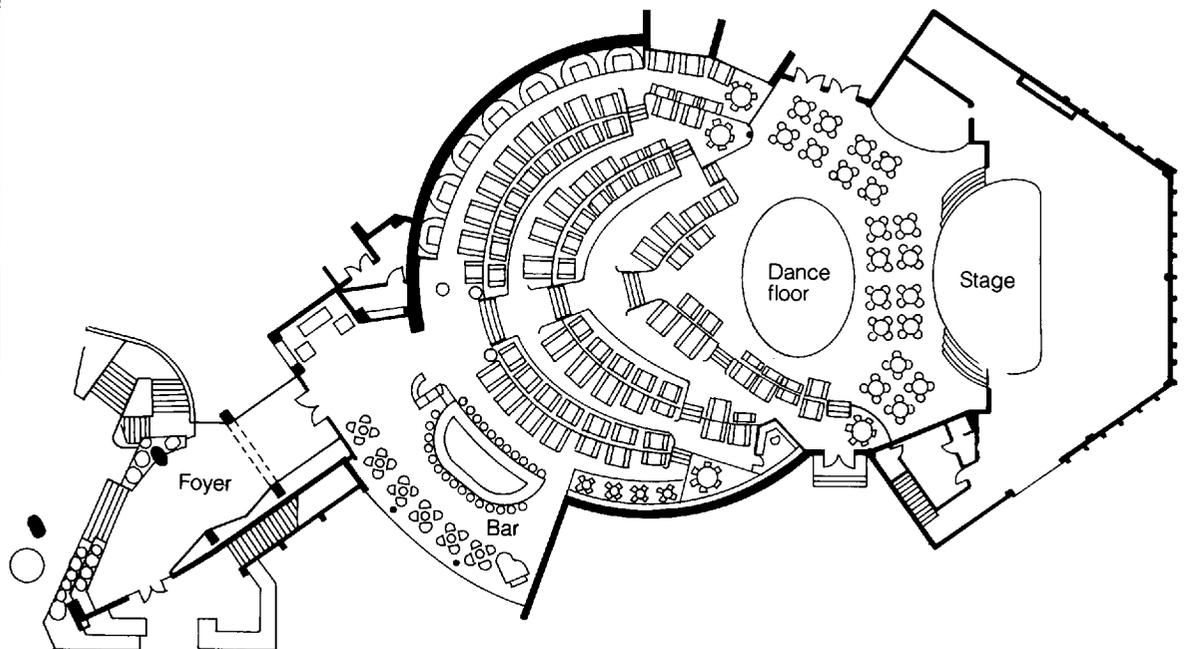
La Ronde Room, Miami Beach, Florida

Designed as a highly flexible theatre/night club/restaurant, La Ronde Room has radial, stepped seating, grouped around a dance floor and stage (a). Peach and violet neon lights circle the domed ceiling and blend with myriad central and table lights. This sense of theatre is emphasised by the sculptural architecture and backlighting effects.

Designers: Lynn Wilson Associates



(a)



4.07 Income and costs

Annual surveys of town and country clubs in the USA are undertaken by Harris, Kerr, Forster and Company. Overall operating results indicate the following breakdown:⁹

	<i>City clubs %</i>	<i>Country clubs %</i>
<i>Club income</i>		
Membership dues and guest fees	35.3	42.6
Food and beverage sales	49.4	43.0
All other sales and income	15.3	14.4
<i>Operating costs</i>		
Payroll and related costs	49.0	47.6
All other operating expenses	47.5	50.4
Available for debt service, capital improvements, etc	3.5	2.0

4.08 Leisure and recreation centres

Leisure centres cover a wide range of activities ranging from sports halls to themed parks. The majority of urban recreation centres are municipally owned, and operated as a community service. Leisure facilities are also being introduced into comprehensive commercial developments (shopping centres, integrated real estate) and as part of hotel facilities.

4.09 Facilities

Current trends in leisure centre design are towards:

- greater use of interior landscaping, incorporating shaped swimming pools, islands, water play features, jets, surges and spray pools,
- widespread installation of facilities for fitness in other premises (saunas, gymnasia, squash courts, solariums),

- extension of interest in hobbies, arts and crafts and opportunities for family participation,
- opening enclosures for summer–winter use of the pool.

4.10 Food and beverage services

Restaurant and bar facilities are seen as profit centres and are invariably positioned to take advantage of the view of the swimming pool, courts, etc. Food service may also be extended to a terrace for pool users and a visitors' viewing gallery.

Management arrangements may provide for:

- catering to be operated under concession or contract,
- food services to be provided by the operating company.

Standards of food service are usually aimed at the majority leisure centre users (popular to mid-market range) with cafés, coffee shops and snack bars (including vending) most commonly provided. Food production generally has to be rationalised, because of locational constraints, and a high proportion of convenience food is often used.

High grade hotels and clubs are an exception where the attractive pool environment may also serve for a wider range of sophisticated events (functions, displays, fashion shows, receptions).

5. Public houses, wine bars, inns and bistros

5.01 Licensing

The sale of alcoholic drink in England and Wales is controlled under the Licensing Acts (see Chapter 1, section 5). Licences are granted for specific purposes of trade:

<i>Types of licence</i>	<i>Sale of liquor</i>	<i>Examples of premises</i>
On-licence	For consumption on or off the premises	Public houses, wine bars, proprietors clubs
Off-licence	For consumption off the premises	Stores, off-licences
Restaurant	To persons taking substantial meals on the premises	Licensed restaurants
Residential	To residents and their friends	Hotels
Combined	Both restaurant and residential use	Hotels
<i>Registration</i>		
Members clubs	Subject to conditions of membership	Registered clubs

The procedures in seeking a licence are laid down and licences may only be granted if the applicant and premises are suitable for the purpose. The licensing justices may take into account matters such as safety, means of escape in case of fire, sanitary facilities and separation of sections in which liquor is sold from other areas. Any structural alterations to licensed premises must be approved by the justices who have also the authority to require alterations before a licence is renewed.

In Scotland there are broadly similar requirements. Members clubs are subject to the rules and conditions of registration. Licensed premises are subject to a number of conditions, including the display of the name of the licensee, and restrictions on the hours during which liquor may be sold. The latter may be extended by an Exemption Order for specific days, occasions or events and for particular licensed premises, for example, offering meals and entertainment or being licensed for music and dancing. The licensing laws in England and Wales are under review and current opinion seems to favour a more flexible approach to licensing hours.

Liquor licences are required in most countries and in some parts of the USA they can be at a high premium. This has led to the growth of membership clubs and other establishments which may attract concessions.

5.02 Public house characteristics

Many country pubs originated as inns and coaching houses and this is usually reflected in the rustic character of their design. The decor of

town 'pubs' is often based on Victorian or Edwardian styling, with emphasis on wood paneling and dark, warm colours, highlighted by brass and polished glass. In all cases individual character is emphasised by wall hangings, ornaments and personal features introduced by the licensee to create congenial atmosphere. Pubs generally have the trading benefits of good location, identification, individuality and convenient access. Changes in design are generally towards the expansion of business through the sale of food, with improvements in decor and furnishings designed to attract wider market interest.

Details of public house trade are given in Chapter 1, section 2.08.

5.03 Pub design

Considerable changes have taken place in recent years in brewery ownership and large-scale investment (see Chapter 1, section 4.03).

Current development is directed towards:

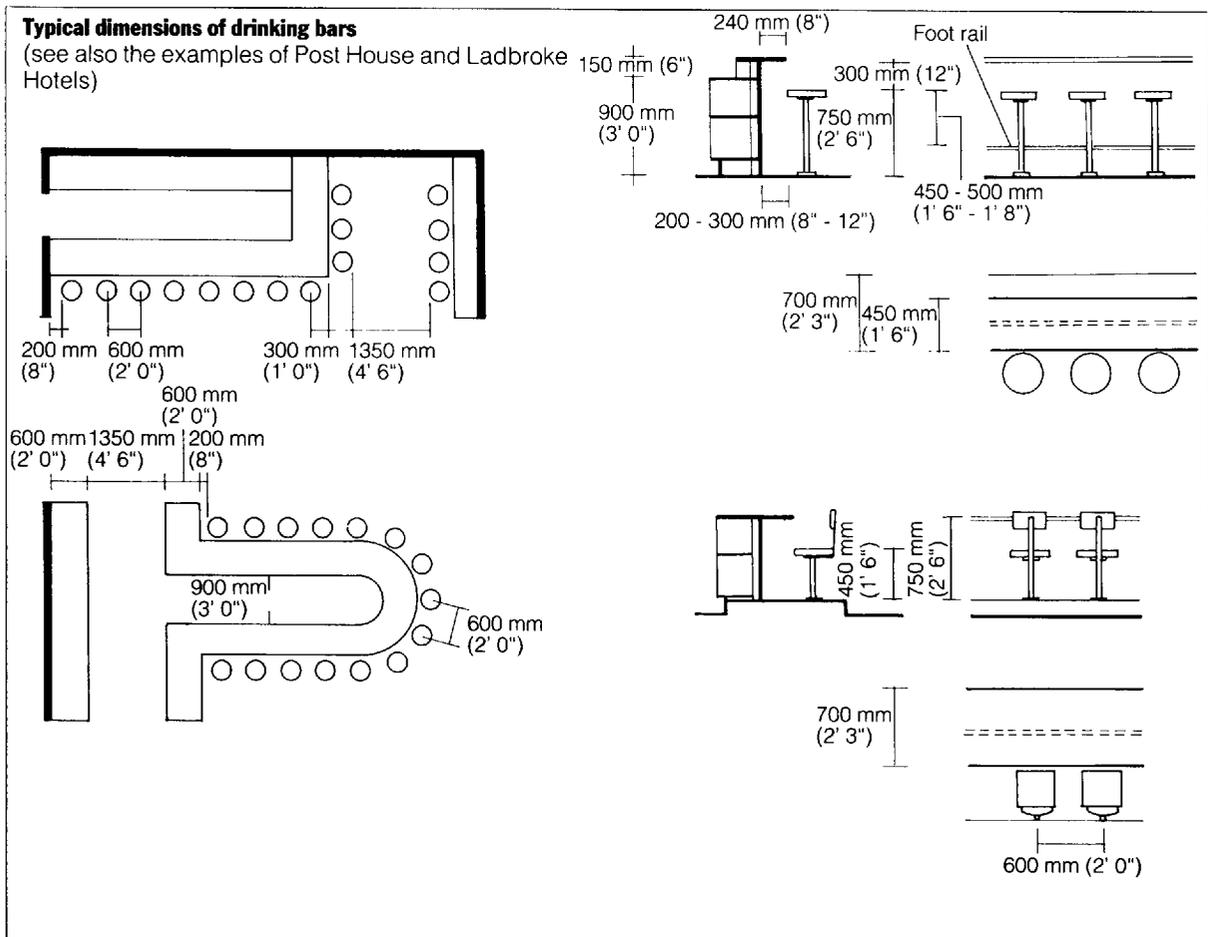
- upgrading and refurbishing of existing premises,
- sale of uneconomic units,
- development of catering chains,
- promotion and changes in the restricting image.

Planning and licensing applications for new premises or major extensions are often subject to opposition and a supporting case will usually need to be made out.

Although there are wide variations depending on location, trade and emphasis, typical 'pub' planning requirements may be summarised as follows:

Facilities	Requirements			Notes	
Car parking	Depends on Planning Authority 1 space: 4–8 customers (max.) 1 space: 2.4–4.6 m ² (25–50 ft ²) based on net space			Assuming 0.6 m ² /person (bar areas) Alternative standard based on net space	
		Rural			
Town	1 space: 10–20 customers			Public parking usually accepted in city centre	
Signs	Essential merchandising role Usually externally illuminated			Approval required Spot and floodlighting	
Space/customer		m ²	ft ²		
	Drinking	0.6	6.5		
	Snack catering	0.9	10		
	Pub restaurant	1.1	12	Limited menu, plated service	
	Steak restaurant	1.4	15		
Serving counters (details in Chapter 9, section 5)	May extend between bars			<i>Typical lengths</i>	
		m ²	ft ²	<i>m</i> <i>ft</i>	
	Saloon counter	13	140	Pub counter	7 20
	Lounge counter	13	140	Lounge counter	5 16
	Catering section	11	120	Dispense counter	2 6
				Snacks section	5 16
			Overall width (including back counter)	2.2 7	

Bars	Small bars are usually preferred		
	<i>m</i> ²	<i>ft</i> ²	
	Saloon (drinks only)	60–70	645–750 Up to 80–90 customers
	Lounge (with snacks)	80–90	860–970 Up to 75–80 customers
Public circulation	Depends on building plans Usually around 10 per cent of revenue producing areas		
Toilets	Typical:	<i>m</i> ²	<i>ft</i> ²
	Male	10–12	108–130 2 WCs, 4 urinals, 2 basins
	Female	8–10	85–108 2 WCs, 2 basins (minimum)
	Staff	3	30 1 WC, 1 basin
Storage	Depends on nature of trade		
	<i>m</i> ²	<i>ft</i> ²	
	Draught beer	40 to 50	430 to 540 } About 50–60
	Bottled stores	40 to 50	430 to 540 } per cent of bar area
	Empties and yard	30 to 40	320 to 430 Variable
	Kitchen and stores	15 to 20	160 to 215
	Miscellaneous	10	110 Boilerhouse
Built areas	Trading area	400	4,300 Minimum: some breweries require larger operating units
	Living area (manager)	110	1,200



5.04 Planning for 'pub' catering

Depending on the location, marketing opportunities and space, pub catering may include high-class restaurants and steak bars, speciality or trend-setting bistro-style bars or counter sales of snacks and sandwiches.

For counter service, a separate food section should be provided with an adjacent kitchen or back-bar equipment. Separate food preparation and storage is invariably required.

Space is usually at a premium and the menu range and equipment will need to be rationalised and geared to a particular style of operation.

A number of the brewery chains have introduced particular styles of catering into selected premises, for example:

Carvery-style restaurants and steakhouses: Roast Inns, Beefeater Steak Houses (Whitbread), Barnabys (Host Group), Toby Carving Rooms, Toby Grills, Drummonds (Charrington),
Seafood restaurants: (mostly owned by Host Group),
Colourful, trendy cafés: Café Quelquechose (Charrington),
Greenhouse restaurants, patio barbeques: (Charrington).

In individual cases, the feasibility of pub catering will need to be assessed in terms of:

- target markets, present and desired image, competition, promotion,
- cost of space conversion and equipment, system of operation,
- projected sales volumes of food and beverages,
- additional costs of operation, staffing and control,
- margins and prices, targets for turnover and return on investment.

There must be a deliberate intention to sell food; with a company-owned chain the impression created by one or two of its houses can give a bad or a favourable reputation for the company as a whole. However, the unique variety and character of the 'pub' lends itself to a wide range and choice of food concepts.

The equipment required usually consists of compact microwave, griddle and infra-red grill for individual meals. Frying is generally impracticable (fat extraction, grease transfer) within a back-bar area.

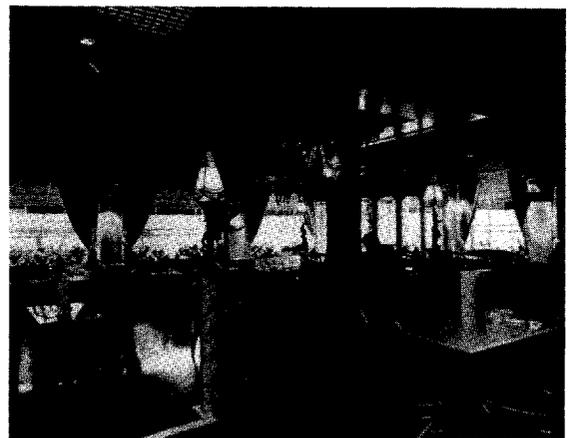
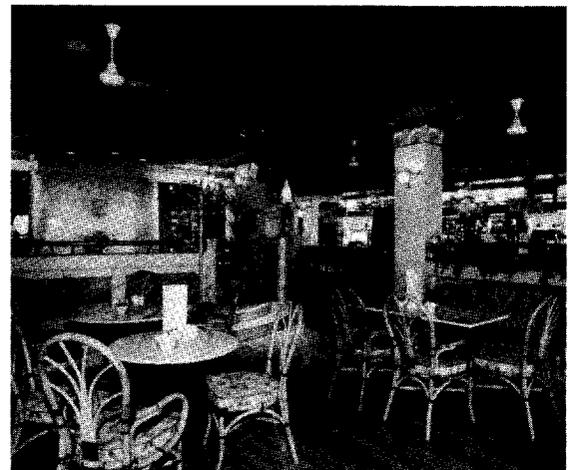
Other displayed items may include heated soup tureens and bains-marie, chilled salad trays and cold food counters. A separate preparation and storage area must be fitted with refrigerators, and benching with a sink and washbasin. For counter meals, disposables are invariably used to reduce the congestion and cost of dishwashing but organised table clearance and cleaning is essential.

Drummonds, London SW3

The latest example of a Drummonds café-bar, opened in 1986, which provides food from breakfast time to lunch, high teas and evening meals together with a full range of beers, spirits, wines and cocktails.

The design is aimed at the female and upmarket clientele. The light and airy interior, which incorporates a water feature in semi-classical mode, is designed to confer a feeling of comfort and style.

Developers: Charrington and Co. Ltd
Photographs: L P A International



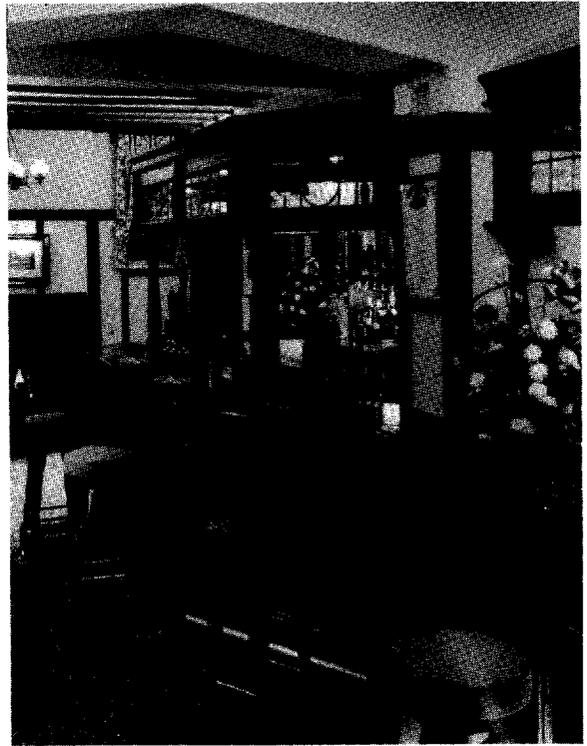
The Swan, Ashford, Kent

The brief for this market town pub was to maximise the trading space and improve the efficiency of the service areas without detracting from the integral quality of the building's character. The kitchen and food display/servery were re-sited and the bar counter extended, creating more space and improved access to food and drink counters (a).

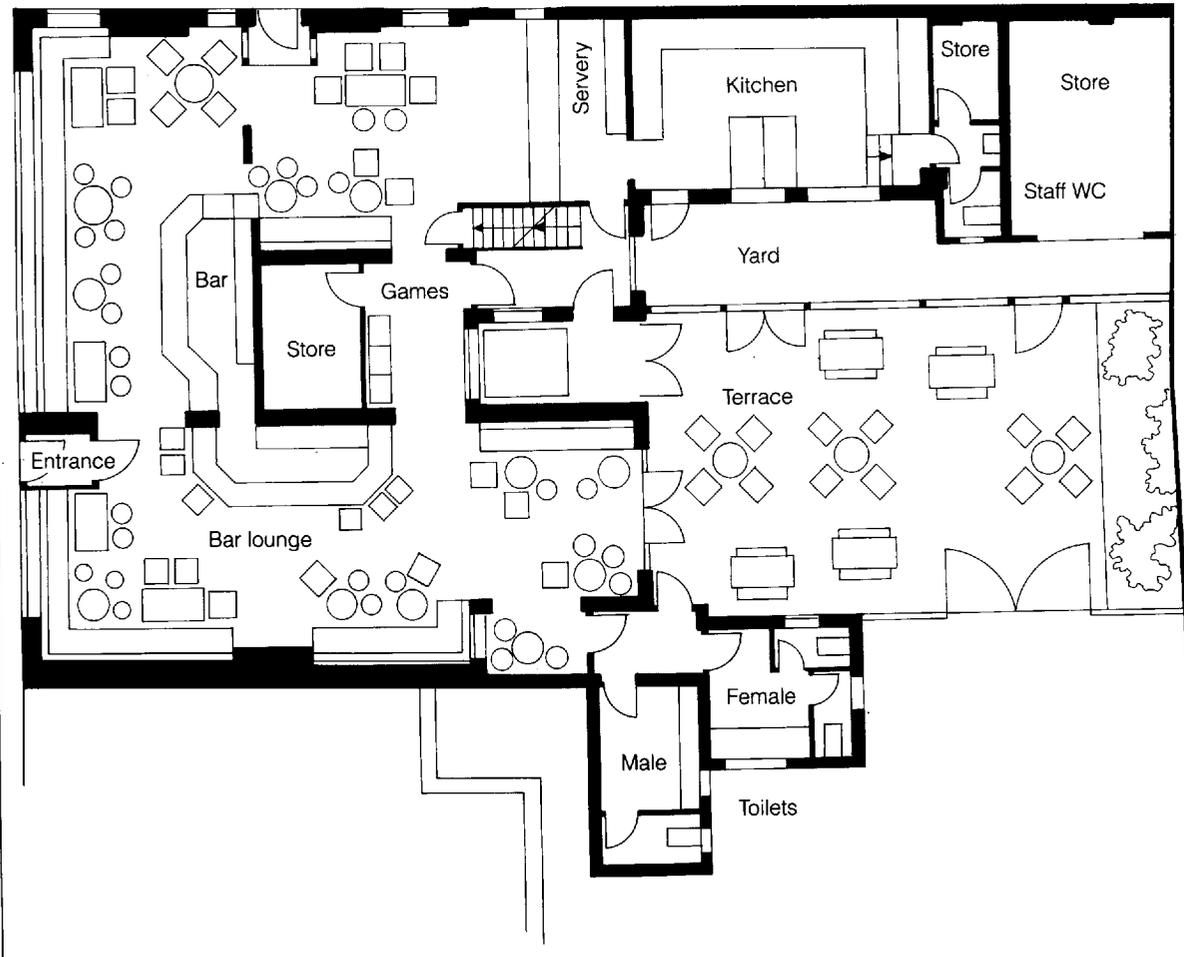
The Swan is a good example of a pub where a modern operation has been introduced into a very traditional atmosphere (b) and where improved facilities were required rather than a change of market.

Plan of ground floor.

Clients: Imperial Inns & Taverns
 Architects/designers: Carmona Dover
 Main contract value: £84,000
 Furniture and furnishings: £12,000
 Equipment: £16,000
 On site: 11 weeks

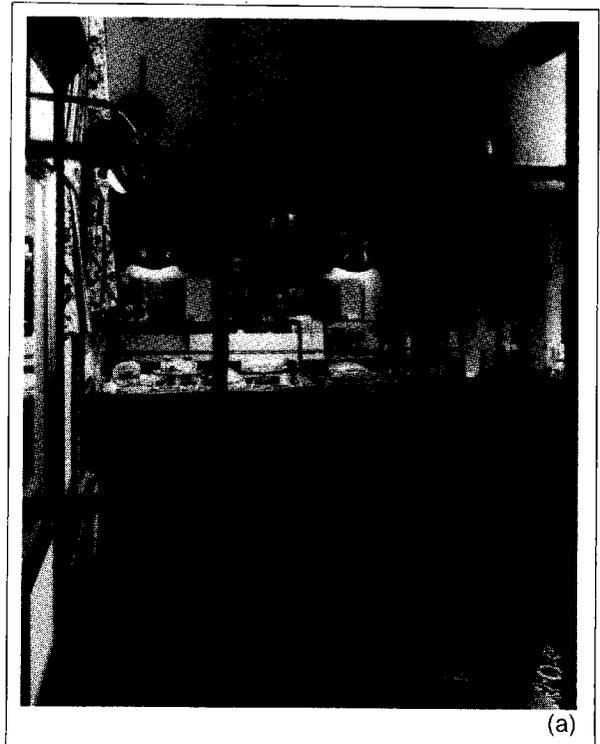


Entrance



5.05 Levels of pub catering

<i>Service</i>	<i>Requirements</i>	<i>Equipment (typical)</i>
1. Cold snacks Sandwiches Ploughman's lunches Pastries, pies Rolls, cold meats	For minimum space and conversion costs. Requires small back bar area or adjacent kitchen with stores. Snacks served over convenient part of bar	Refrigerator, dry store, washing-up sink, work top, handwashing facilities, covered display cabinet, bar counter space, condiment sets, paper napkins, plates, knives and forks, infra-red toaster, coffee-making unit (optional)
2. Hot snacks Individual pies Pasties Toasted sandwiches Sausages	More intensive back-bar equipment or kitchen required. Section of bar set out for food service or a separate side counter installed	As (1) together with serving counter, heated display cabinet, micro-wave oven, infra-red toaster, coffee-making unit (optional)
3. Popular catering, limited menu of: Hot snacks Fork dishes Vegetables Salads	Separate kitchen for preparing and cooking food. Extract ventilation required. More extensive display and service counter. Food may also be served at tables. Most dishes are bought in ready prepared	As (2) but larger equipment and more extensive work tops and storage. Plus deep-freeze cabinet, salad preparation sink, oven range, bain-marie
4. Popular catering. Full set menus as above, with: Soup Chips Puddings or cheese board	Separate equipped kitchen with designed services and stores. Counter display section and cash desk for taking orders. Table service usually required, some tables being laid up for meals	As (3) but with convection oven and boiling top (alternative to range), deep-fat fryer, ice cream conservator (optional)
5. Pub restaurant. More expensive menu. Usually designed as featured: Steak bar Grill and griddle carvery	Restaurant separate from bar with its own entrance. Separate kitchen but the restaurant may feature displays of: self selection of meat, etc, flamed grill, roasting, carvery counter, self-service salad bar, sweet counters or trolleys	Purposely designed kitchen with high quality catering equipment. As (4) but with specialised grill or roasting ovens, twin deep-fat fryers, griddle, salamander, water boiler, coffee-making unit



(a)

6. Private parties, functions and banquets

6.01 Types of events

Food services for organised groups of people call for flexibility in room arrangements and furniture to cater for different requirements but highly organised food preparation and service.

Details of food production systems are given in Chapter 8, section 1 and food service requirements for buffets and functions are outlined in Chapter 9, section 6.

Rooms used for functions are invariably multi-purpose and should be designed to allow alternative use for conferences, meetings, shows, receptions, dances and other needs. Traditional hotel ballrooms usually cater for large conventions. Smaller meeting rooms may be used for private parties. Specialised dining rooms, such as those for traditional Japanese service, may also be provided where the market justifies such a specific use.

To allow for changes in layout all furniture must be portable and easily stacked. Extensive storage – usually 10–20 per cent of the hall area – must be provided for furniture and equipment.

6.02 Banquet hall design

Function rooms and banquet halls should normally be divisible (usually into two or three) to allow for different numbers and multiple use. Each divided part must have separate customer access (through an individual or common foyer) and have a separate service lobby.

Partitions must be easy to move, edge sealed and sound insulated. Usually double-leafed partitions (horizontal sliding or vertically folding) are required.

Tall ceilings – 3.4–4.6 m (12–15 ft) – over the whole area or central part of the room create a sense of occasion and grandeur, allowing suspended lighting pendants or chandeliers to give dynamic interest.

Spaciousness and vitality are emphasised by wall mirrors, glassware and silverware, colour accents, gilding and reflected lighting.

Sound absorbency treatment may be required for parts of the ceiling and walls to reduce reverberation.

Air-conditioning is usually provided by mono-zone system, separately balanced for each divisible part, giving 18 litre/sec. fresh air/person, with up to 50 per cent fully conditioned recycled air.

Lighting and sound systems must be independent for each part, with master and secondary controls. Track lighting systems with adjustable spot or down lamps may be installed. Power points, socket outlets and terminals (television, computer communications and controls) should be installed at strategic points.

For fire safety, surface flame spread is limited to grade 1 or non-propagating. Alternative exits should be arranged within 30 m (100 ft) travel distance, leading to fire escape routes calculated for maximum occupancy, usually 1.0 m²/person (10 ft²) (see Chapter 6, section 7.07).

For conference facilities installed microphone points, loud speakers, projection facilities and automatic lighting controls are all important.

Dinner dances, discotheques and shows demand sophisticated sound control systems and programmed lighting with track suspension for lamps. Portable dance floors (or permanent ballroom floor with carpet covering) should also be considered.

Functions and banquets may require separate provision to be made for:

- *direct access*: apart from hotel lobby and guest circulation,
- *additional parking*: usually calculated on 1 car space/person,
- *cloakrooms and toilets*: based on 0.3 m²/person (male and female),
- *banquet kitchens*: independent or as an extension of the main kitchen.

6.03 Seating plans

Seating capacities depend on the size and dimensions of the room.

Typical allowances:

Type of function	per person	
	m ²	ft ²
Banquet, seated function	1.0–1.4	11–15
Reception	0.6	6
Foyer, lobby, coffee service (some crowding)	0.3	3
Buffet (including display and circulation)	0.7–1.0	7–11

Formal layouts provide lines of tables, the 'top' table having sprigs or extensions at 90° or other angles.

Tables are normally 750 mm (2½ ft) wide with 600 mm (2 ft) spacing/person. Table lengths are usually 2,000 mm (6½ ft) or 1,200 mm (4 ft). To allow for chairs, access and circulation, a minimum of 2,000 mm (6½ ft) should be provided between sprigs and 1,400 mm (4½ ft) around the perimeter.

Informal layouts provide seating at separate tables. Round tables, 1,500 mm diameter (5 ft) seating 8, or 2,000 mm (6½ ft) seating 10–11, are often used, with 1,500 mm (5 ft) spaces between.

Cabaret layouts involve the arrangement of individual tables (round or rectangular) around a central space for dancing or cabaret. Arrangements for furniture are as follows:

<i>Tables</i>	<i>Requirements</i>
Storage	Normally with folding legs and leaves for stacking on transporters
Legs	Cantilevered or positioned to allow knee space
Linkage	Tables connected together with levelling adjustment
Dimensions	Modular to 600 mm (2 ft) spacing. Tops interchangeable
Buffets	Special arc quadrant tables combined to give variable rounded, oval, serpentine, half circle, etc. shapes
Construction	Strong, durable, free from hazardous projections, rigid when assembled
<i>Chairs</i>	
Stacking	Interstacking chairs fitting mobile dollies or carriers
Construction	Light, robust, free from underside projections, resistant to marking, scraping and impact
Styling	To suit character of hotel and multi-use. Ergonomic dimensions essential
Storage	At same level with direct wheeled access

1. Popular Food Service, December 1984/January 1985.
2. 'Leaders in the UK restaurants/take-away franchise market', in *Caterer and Hotelkeeper*, 17 May 1984, p.55.
3. Cracknell, H., and Nabis, G., *Practical Professional Gastronomy*, London, Macmillan, 1985.
4. Crewe, Q., *International Pocket Food Book*, London, Mitchell Beazley, 1980.
5. Smith, D. (ed.), *The Good Food Guide, 1986*, London, Consumers Association, 1986.
6. Yan-Kit So, 'Eating ethnic - Chinese', in Smith, D. (ed.), *The Good Food Guide, 1986*, London, Consumers Association, 1986.
7. The Brewers Society, *Beer Facts*, Brewers Society Reports and Home Offices Statistics, London, 1985.
8. NRA News, *Foodservice Trends*. Estimates based on US Department of Commerce Bureau of Economic Analysis and Surveys by Harris, Kerr Foster, June/July 1983
9. *Clubs in Town and Country*, 1985.

11

Non-commercial Sector

1. Employee feeding services

1.01 Requirements

Employee food services are characterised by a number of specific requirements:

Scale of operation

The numbers of meals required at many large work sites allow economies of scale in space and equipment costs.

Numbers of main meals	Typical area/meal	
	m ²	ft ²
200	0.58	6.25
400	0.42	4.6
600	0.35	3.8
800	0.31	3.55
1000	0.28	3.05

For food storage, production and service, dishwashing and staff facilities.

Concentration of demand

To supply meals within a specific 2–2½ hr period the rate of service is critical.

Typical provisions	Customers/minute
Single-line, self-service cafeteria	9
with by-passing and dual cash desks	10–14

Free-flow or multi-counter service is usually practicable for over 600 meals/day. The demands usually peak at the beginning of each break period and simulation studies should be used to determine the optimum layout and production cycles (see Chapter 8, section 1.03).

Menu requirements

Meals must be balanced to provide variety and to meet nutritional standards. Menu changes are usually structured on a 14–21 day cycle. Food preferences tend to be conservative and popularity ratings favour traditional food. Individual choice is usually limited to two or three main alternatives for economy. Each alternative must be presented with a similar attraction and value. Ethnic and religious constraints may also need to be considered.

Operation

Catering services are provided at some 23,500 work sites in the UK. The take-up of cooked meals in 1984 was 41 per cent, with a further 17 per cent purchasing refreshments during the main break.

Labour

Food costs were 56:44 per cent and the average daily output was 23 cooked meals per full-time catering employee.¹

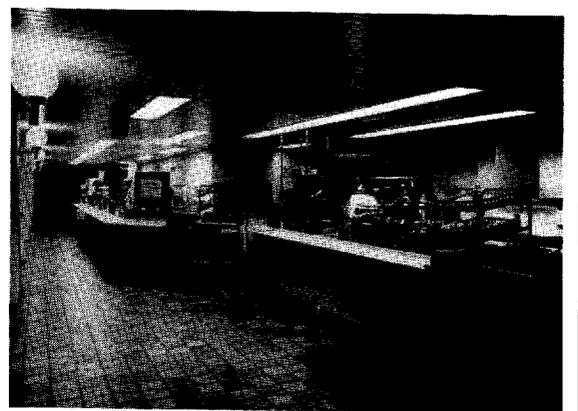
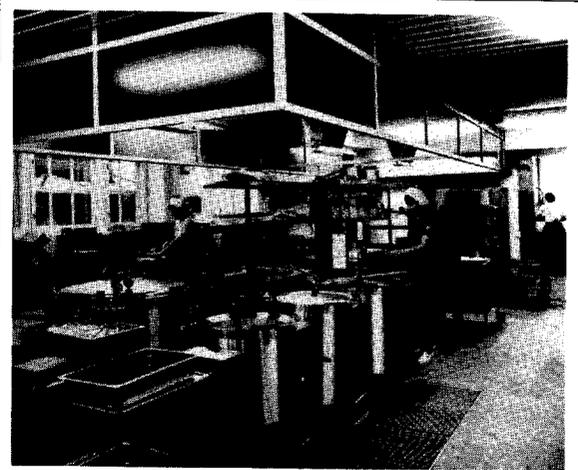
Dining areas

In large industrial work sites separate facilities are usually provided for:

- directors' dining room: semi-silver service,
- senior staff and visitors' dining room: plated service,
- main restaurant: cafeteria service.
- automatic vending: beverages and snacks.

The menus usually overlap to a large degree, with some supplementary items being added for the dining-room services. With changes in industrial relations the trend is towards less differentiation between staff facilities. In 1984, 60 per cent of catering sites in the UK were single status and most had only one dining room.

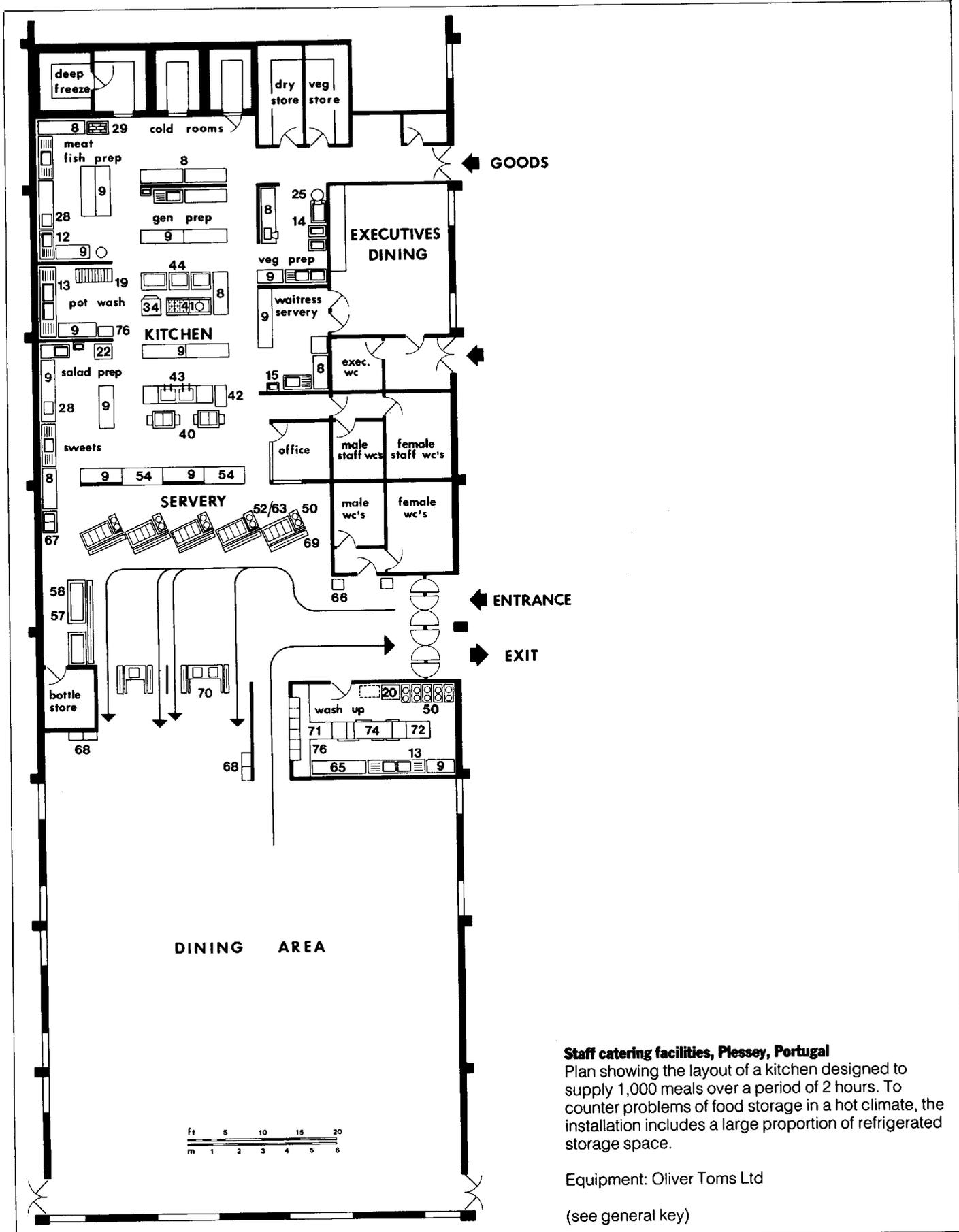
Supplementary coffee lounges are sometimes provided to increase the seat turnover and utilisation of the main restaurant areas.



VARK Tampere, Finland

Staff catering facilities for 800–1,300 employees showing the main kitchen and self-service counter.

Equipment: Metos Instrumentarium

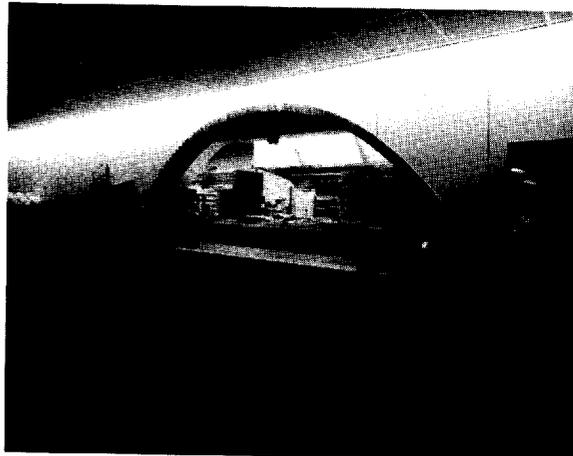


Staff catering facilities, Plessey, Portugal

Plan showing the layout of a kitchen designed to supply 1,000 meals over a period of 2 hours. To counter problems of food storage in a hot climate, the installation includes a large proportion of refrigerated storage space.

Equipment: Oliver Toms Ltd

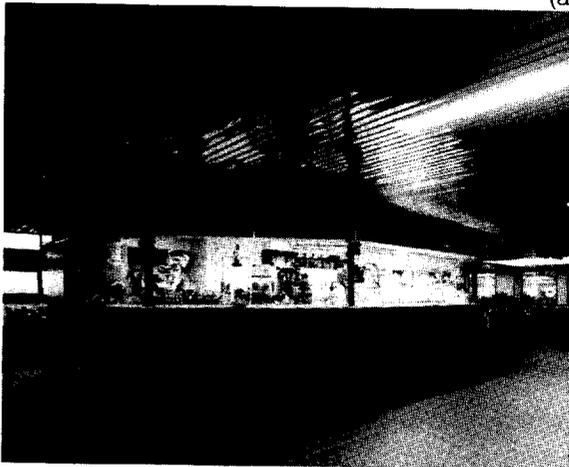
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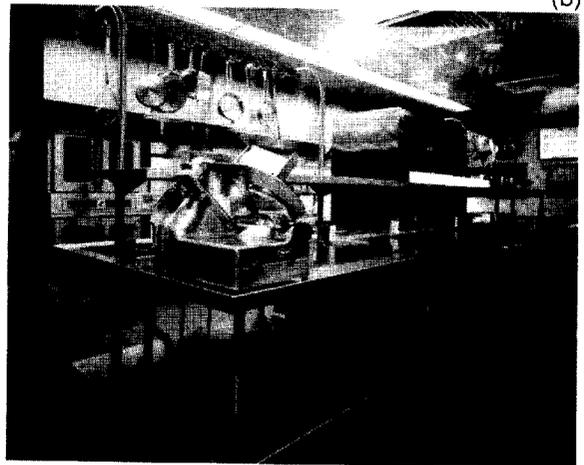
(a)



(b)



(c)



(d)



(e)

Manufacturers Hanover Trust Company, Hicksville, Long Island

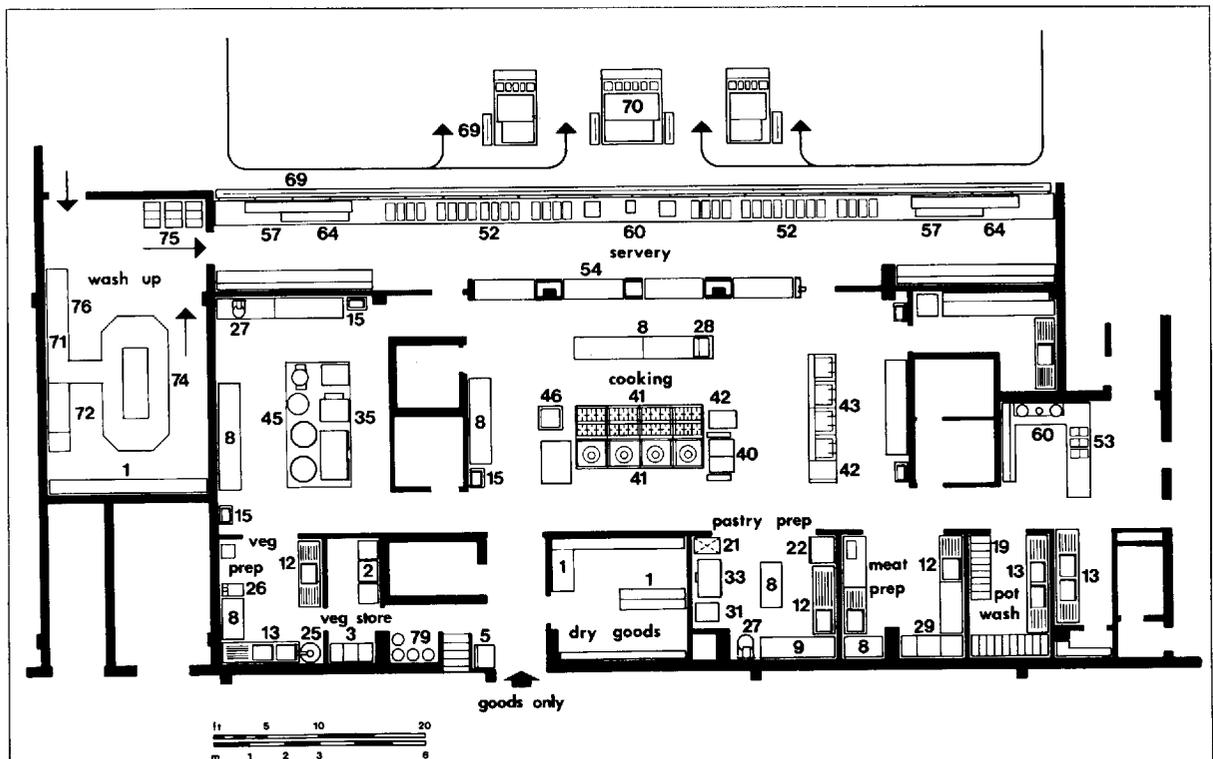
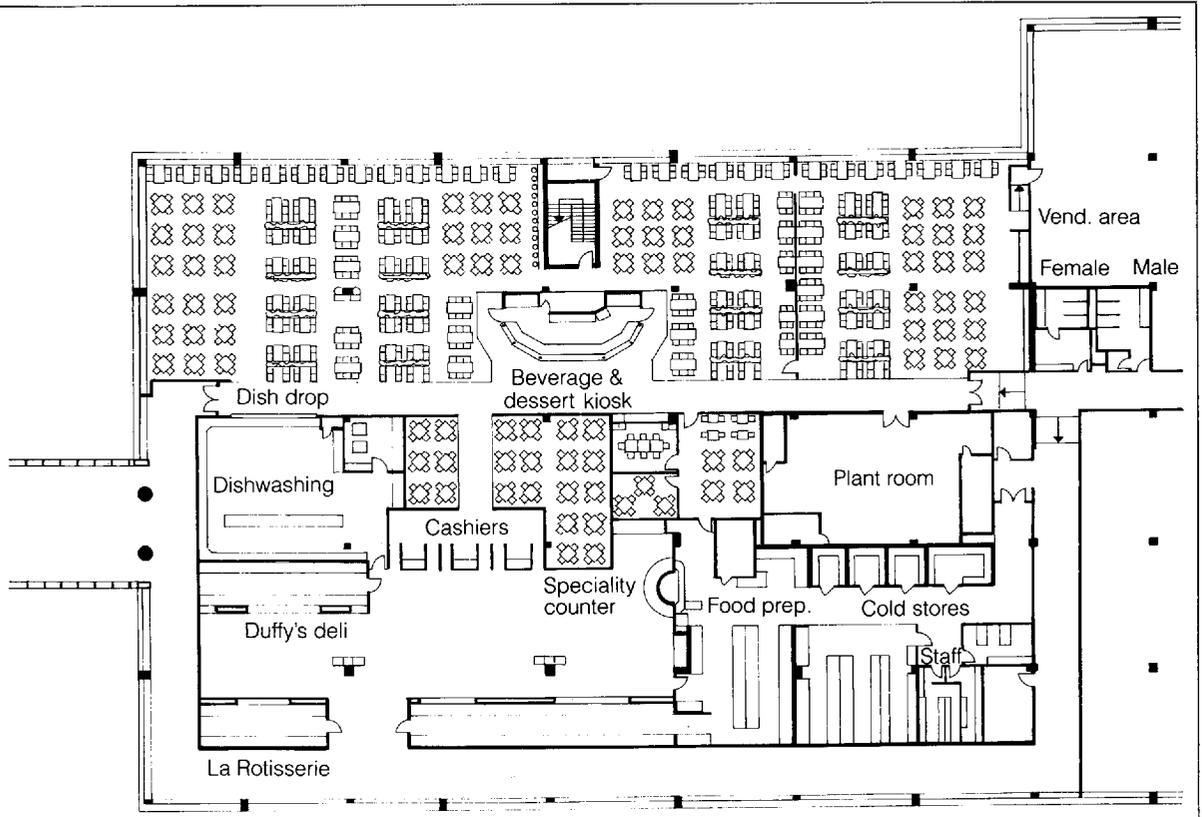
Manufacturers Hanover Trust, one of the largest financial institutions in the United States, installed a new employee dining room and support facilities in 1984. The objective was to offer a wide choice of menu in a non-institutional environment and this has been achieved by the use of individually designed food shops arranged as a food court. Names such as Duffy's Deli, The Bakery (a), La Rotisserie (b), By Land or Sea, Daily Special and Sweet Exchange (c), characterise the variety of food available.

This facility does not require a traditional kitchen. A pre-production area (d) is used to prepare and assemble food for distribution to the individual units where it is finally prepared and served fresh. Special features include a conveyorised serving system and helical screw troughs to convey refuse to twin compactors and noise baffling of the dishwash area (e).

The success of the facility is reflected in its patronisation by 1,800 employees for lunch (90 per cent of the total) and 1,200 for breakfast.

Food service management and planning consultants:
Beer Associates

Clients: Manufacturers Hanover Trust Company, Mr Lorand-Forrest, Vice-President, Director of Food Service

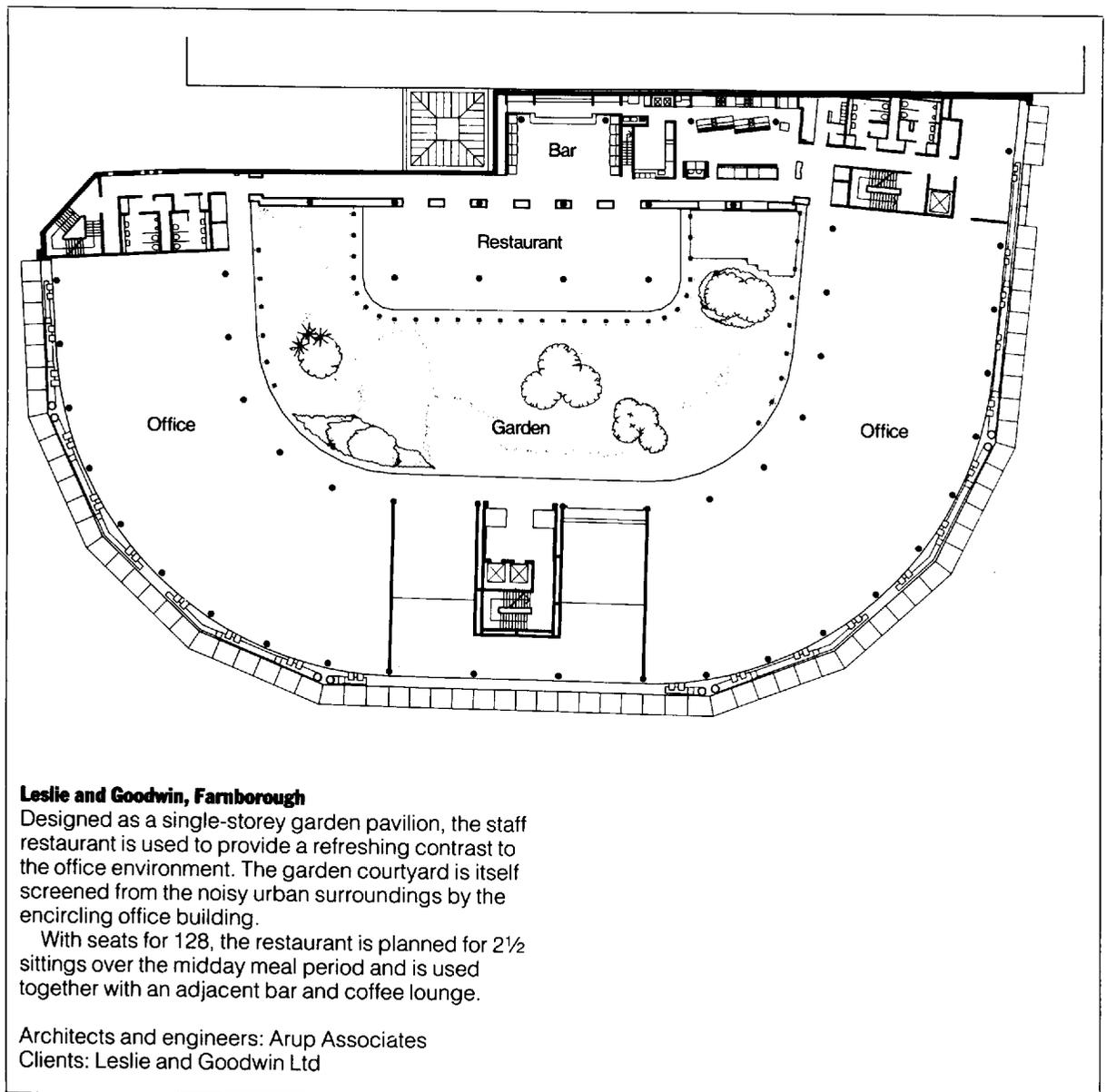


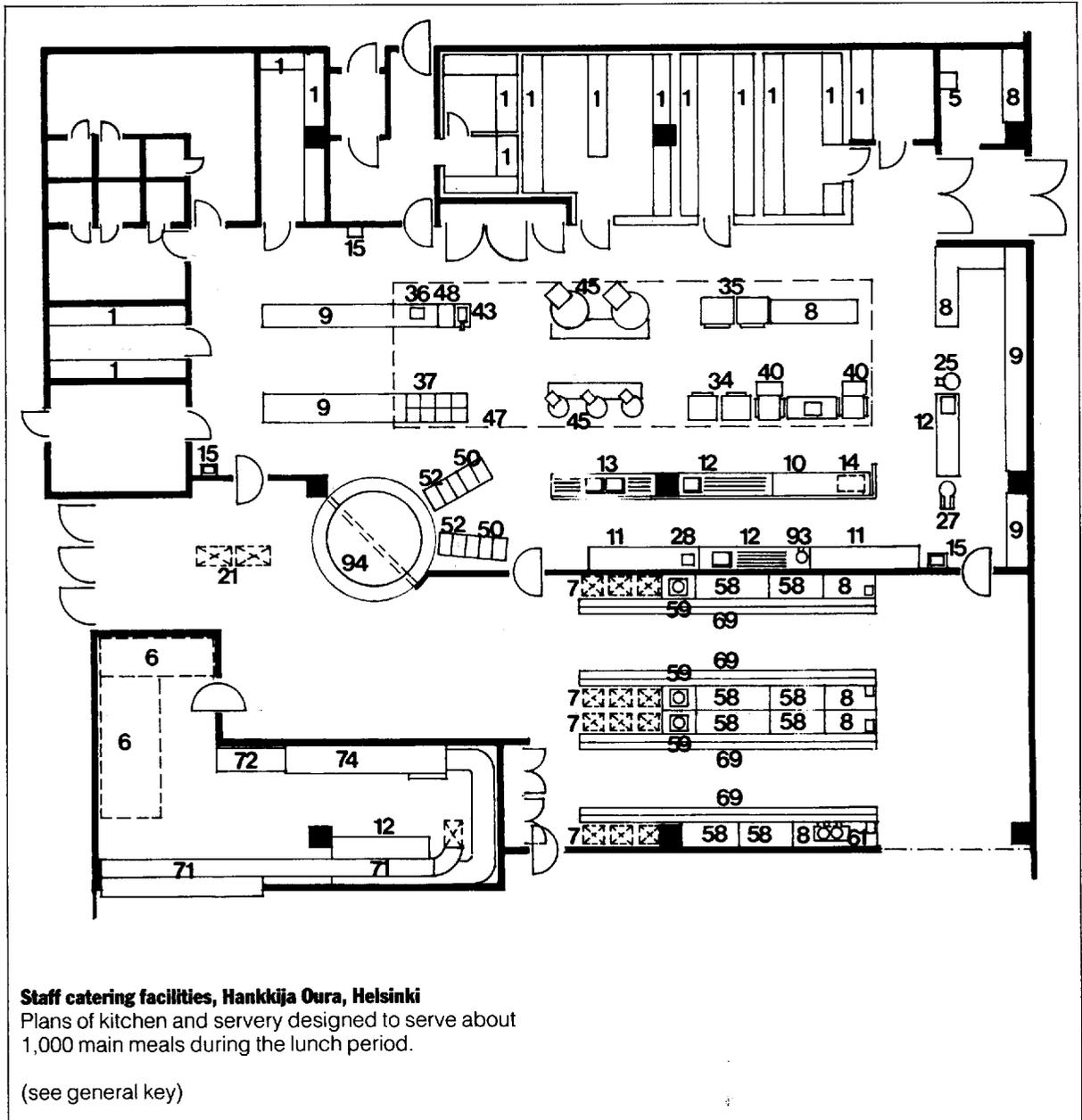
General Foods Ltd, Banbury

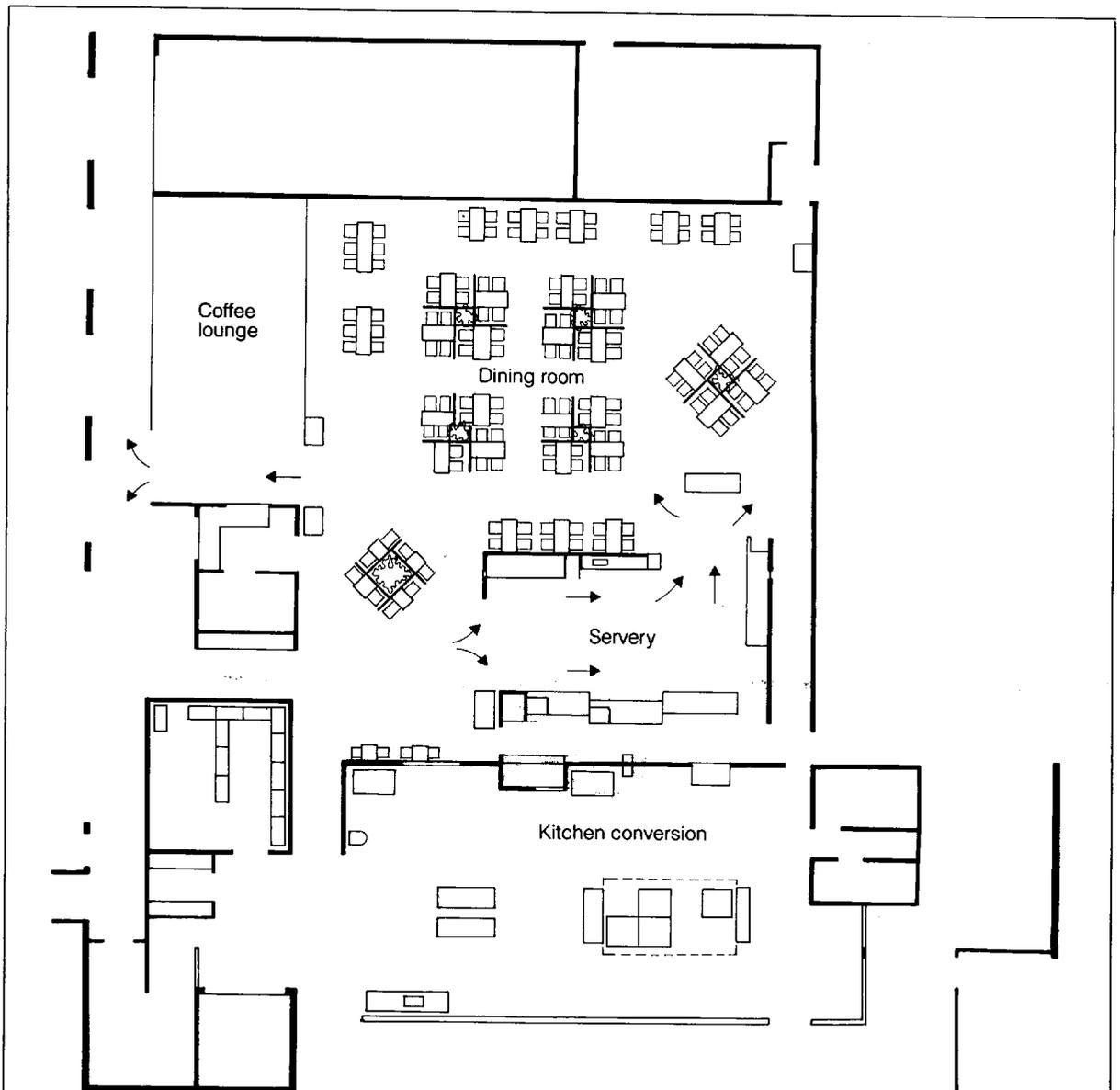
Plan showing the layout of the kitchen equipment designed to serve approximately 900 personnel.

Equipment: G. F. E. Bartlett and Son Ltd

(see general key)



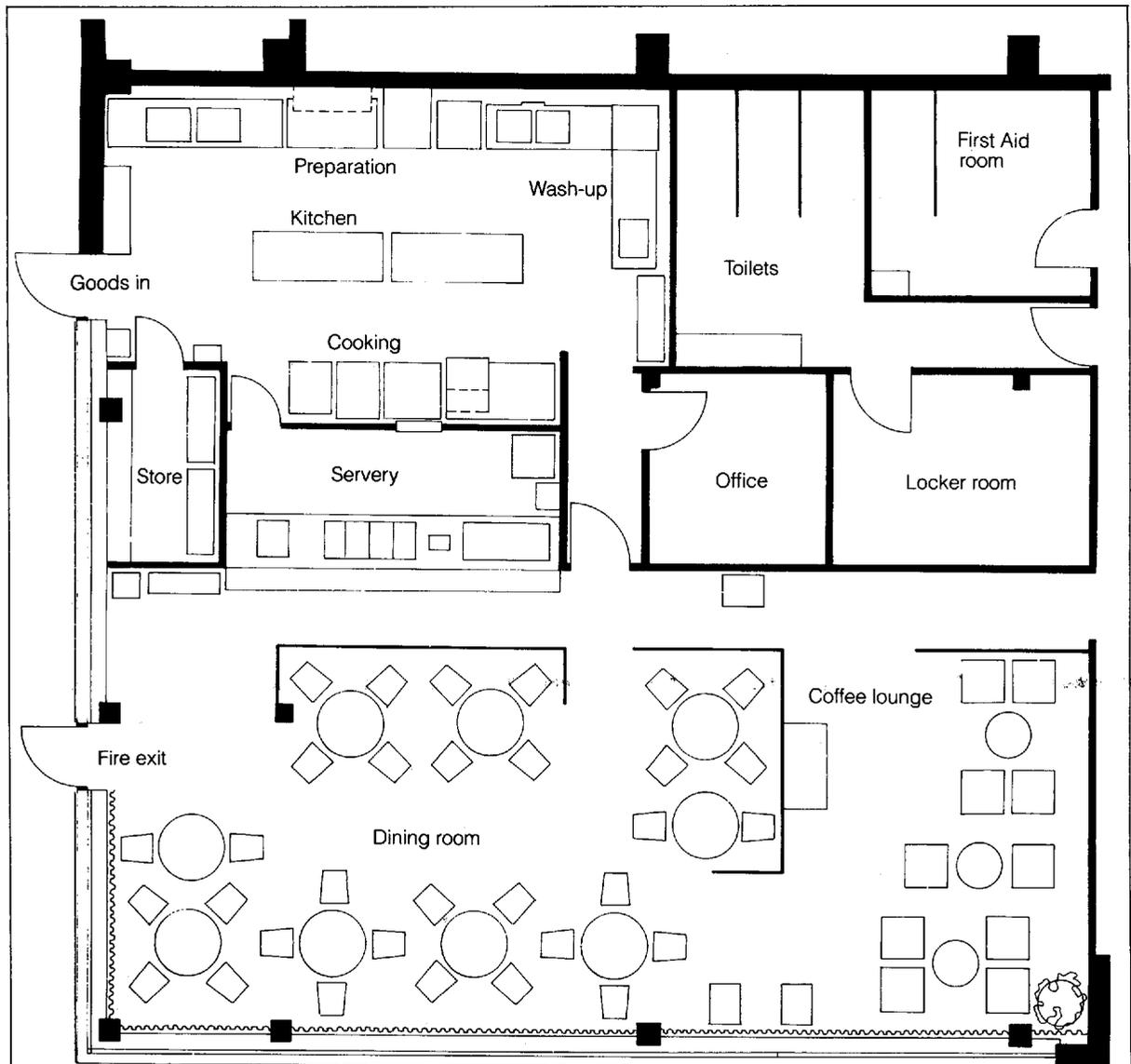




Ford staff feeding facilities, Enfield

Previously operating with separate directors', supervisory/clerical and workers' dining rooms, the redesigned facilities have been combined for single status dining for 500 employees. By providing a separate coffee lounge – which also provides vending for night staff – it has been practical to reduce restaurant seating to 120. The conversion was carried out during a 3-week shutdown. Much of the existing kitchen equipment was retained but regrouped.

Catering consultants: Tricon Foodservice Consultants Ltd
 Client: Ford Motor Company



Transcare, Leicester

Designed for a company employing 150 drivers and 20 office staff, this facility can provide midday meals for more than 40. Mainly prepared food is used.

Catering consultants: Tricon Foodservice Consultants Ltd
 Clients: Transcare Ltd

1.02 Equipment

Employee feeding services often involve large scale production of food with peaked demands. Before specifying equipment, it is necessary to carry out a detailed analysis of

- *menu requirements*: food production processes, flows and quantities involved.
- *staffing*: difficulties of recruitment, factors affecting wage rates and employment,
- *supplies*: availability of food supplies locally or from central production sources,
- *systems of food production* and equipment requirements to provide the outputs needed (see Chapter 8, section 3.12).

Some of the key considerations in selecting equipment for medium to large scale services are summarised below and further details on equipment selection are provided in Chapter 8.

Storage	Depending on supply arrangements, large stores are usually required with separation of dry goods, fresh vegetables and chilled and cold storage
Preparation	May be based on fresh or prepared food. Food may also be centrally prepared for vending machines, remote snack and counter service and for take home sales to employees (bakery, pastry, prepared dishes, etc)
Equipment	General purpose cooking equipment is usually installed to allow for variations in menu
Batch production Ovens	Large ovens of 145 l. (5 ft) capacity are usually mounted on stands or tiered to save floor space and fitted with rack systems for pre-loading and transporting food to other areas. For cook-chill systems the racks also fit refrigerated holding units. Ovens are usually forced convection heated with programmed controls and may include steam or evaporative regulation of moisture during the cooking cycle. Self-cleaning oven linings are usually fitted
Boilers	Bulk boiling pans of 40–135 l. (10–30 gals) and tilting kettles 40 l. (9 gals) are commonly used. In large installations steam heating may be supplied from a central generator
Steamers	Steam ovens are often large cabinets operating at atmospheric or low pressure, 3.5 kN/m ² (1/2 lb/in ²) for bulk cooking. High pressure steamers up to 105 kN/m ² (15 lb/in. ²) may be installed for high speed repeat use with prepared frozen or chilled food

Fryers	Large output fryers have integral filtering, fast heat recovery and automatic control and safety devices
Bratt pans	Self-contained pans for braising, frying and poaching are fitted with trunnions for tilting and emptying
Salamanders	Broilers or grillers may be used for flash heating and cooking supplementary items or call order meals
Infra-red heaters	Specialist equipment with banks of infra-red rods combined with double sided contact heating for inserted trays of prepared food. Mainly used with cook-chill systems

1.03 Large scale production

Batch production of food in very large quantities (in excess of 1,000 l.) presents difficulties in

- controlling the process (temperature distribution, cooking time, product consistency),
- regulating the work and output in parallel with demand.

Continuous cooking equipment

Continuous cooking equipment enables small, measured quantities of food to be conveyed through the process at a controlled rate. The equipment may be linked to conveyors transferring food to the service counter. Large scale equipment is available for continuous boiling, steaming, broiling (with infra-red heat), grilling, deep fat frying, toasting and baking. It is suitable for any operation requiring a substantial flow of identical products as in fast-food operations (hamburgers, pizzas).

Continuous preparation processes

Central production on a large scale warrants the installation of extensive mechanised handling equipment for pastry making (mixing, rolling, portioning, shaping, filling, closing), sandwich preparation and packaging and other repetitive operations.

1.04 Dishwashing

Arrangements for collecting used tableware affect the layout of the dining areas, circulation planning and equipment. The options include: table collection by waiting staff (directors' dining rooms) and trolley collection or self-clearance (self-bussing); systems for cafeterias.

- *self-clearance*: acceptable for regular users familiar with the system,
- *tray systems*: designed to be used on the table during the meal and for insertion into

collecting racks for removal,

— *collection*: usually specially designed with multiple shelves to receive the trays with clearance spaces for the tallest items (usually the water glass). Shelf assemblies should be at a convenient height, between 900 and 1,500 mm (36 and 60 in.),

— *remote collection*: conveyor belt systems may be installed as an alternative to trolleys to convey dishes back to the dishwash area. The whole system must be accessible for cleaning,

— *dishwashing*: automatic conveyor type dishwashers are normally installed (300 meals/hr) with large 'flight' machines for 500 meals/hr. Separate spray dishwashers provided for remote dining-room and counter services.

1.05 Energy requirements

The heavy loading requirements for kitchen installations invariably necessitate high voltage, three-phase electricity supplies. Gas is often preferred for easy control and high capacity output. Installed equipment ratings for kitchens (including stores) producing traditional meals are generally in the order of 1.7–1.9 kW/m² or 0.8–1.0 kW/meal capacity. The energy used in food production is normally about 4.8 MJ/meal for medium scale, reducing to 3.5 MJ/meal for large scale operations (see Chapter 8, sections 8.02–8.05).²

1.06 Centralisation of production

Central production was used in some 2,700 site kitchens in 1984 in Great Britain and this was forecast to increase to 3,100 kitchens by 1990. Traditional methods of food preparation were expected to drop from 20,800 sites to 20,400 sites in the same period, mainly through growth of cook-chill methods.³

Cook-chill is particularly suited for meals supplied to remote areas or for weekend and overnight shiftwork.

As a rule, cook-freeze methods are not feasible below 2,000 meals/day but off-site production may be used for large scale distribution to several units.

Shift operations were 11 per cent more costly to service than day works in 1984 and the trend is towards automated meals.

1.07 Oil rig and remote catering services

Special conditions apply in catering for oil rigs, construction sites and remote stations and these are largely planned, supplied and operated by international catering contractors.

Supply contracts normally require re-tendering on an annual basis and take into account service and standards as well as costs.

Oil rig and remote catering usually have speci-

fic requirements:

— the number of workers is usually large and the workforce changes with different phases of development,

— catering covers all meal requirements, including provision for shifts over 24 hours and for different ethnic groups, with implications for menu planning, staffing and cleaning,

— to allow for difficulties and delays, supplies may need to be stocked for long periods in each unit (for example, a minimum of 21–30 days supply on North Sea oil rigs) involving extensive refrigerated storage,

— catering services usually incorporate a wide range of refreshment and morale boosting needs (shopping, cinema and leisure interests, psychological and environmental variety) as well as general cleaning and hygiene operations,

— accommodation and catering facilities may have to be housed in temporary or portable units which can be purposely designed modules or adapted for this use,

— engineering services are invariably installed on site (generators, treatment plant, disposal systems) and this may limit the type of equipment which can be used,

— based facilities need to be developed to provide maintenance, transportation and replacement services.

1.08 Food contractors

About 25 per cent of the outlets (5,500 sites) for employee catering in Great Britain are managed by commercial food service companies under contract to the employing organisation. These provided 42 per cent of the total meals in 1984.³ Self-management was more common in large operations serving over 450 meals per day. Movements from direct to contract management are mainly to obtain expertise and save costs.

In the United States the total food and drink sales projected for 1984 were \$5,325 millions, of which food contractors supplied almost 64 per cent.⁴

Food contractors (US)	% of total sales
Manufacturing and industrial places	48.3
Commercial and office buildings	15.3
Institutional employee feeding (direct)	36.4
TOTAL (food and drink sales)	100.0

American food contractors also experienced the strongest growth in 1983–4, particularly in the commercial and office feeding sector. Employee feeding generally increased by 4 per cent in 1983–4 as a result of higher employment.

2. Health care feeding services

2.01 Administration of health and social services in Great Britain

The organisation of health and social services under the National Health Services Act 1977 (as amended) has been subject to periodic review. Since 1982 the structure has been based on a tiered system of administration.

Authority	Broad responsibilities
Secretary of State for Social Services	Administration of National Health Service, Social Security and Personal Social Services
Department of Health and Social Security	Allocating resources to regions, policy making and issuing advice
14 Regional Health Authorities	Strategic planning, coordinating plans of districts, allocating resources and monitoring implementation
192 District Health Authorities	Delegated authority for planning and operating services through units of management. Liaison with Local Authority and other services

There were some 2,800 hospitals within the National Health Services in 1980 and hospital services accounted for 63 per cent of the overall expenditure. Catering costs represented 6.3 per cent of hospital revenue.⁵ In 1983 the NHS employed 38,000 catering staff. Expenditure was £380 million (less £42 million recovered from staff restaurants). 52 per cent of costs were on labour, 48 per cent on materials.⁶

About 200 hospitals, providing almost 10,000 beds in 1986, were independent, 93 being owned and operated by charitable organisations but with a growing number investor owned. The private institutions may operate their own feeding services directly or through contracted arrangements.

2.02 Structure of hospital services

In a large hospital a wide range of feeding services are likely to be required:

Services to	Operational requirements
Patients in wards	Tray or container service with food distributed: — direct from central kitchen in heated containers, — indirectly to ward service kitchens for end cooking or finishing
Bed-confined or dietary needs	Individual trayed and plated meals to order or special instruction
Ambulant or convalescent	Individual meals served in dining areas or from serving trolleys
Staff	Self-service cafeteria with one or multiple counters
Consultants, etc	Waited table service in separate dining room
Supplementary	Vended service of snacks and beverages
Night-duty staff	Vended service of individual hot meals or counter service of call-order meals
Visitors	Counter services of snacks and refreshments (which may be independently operated)

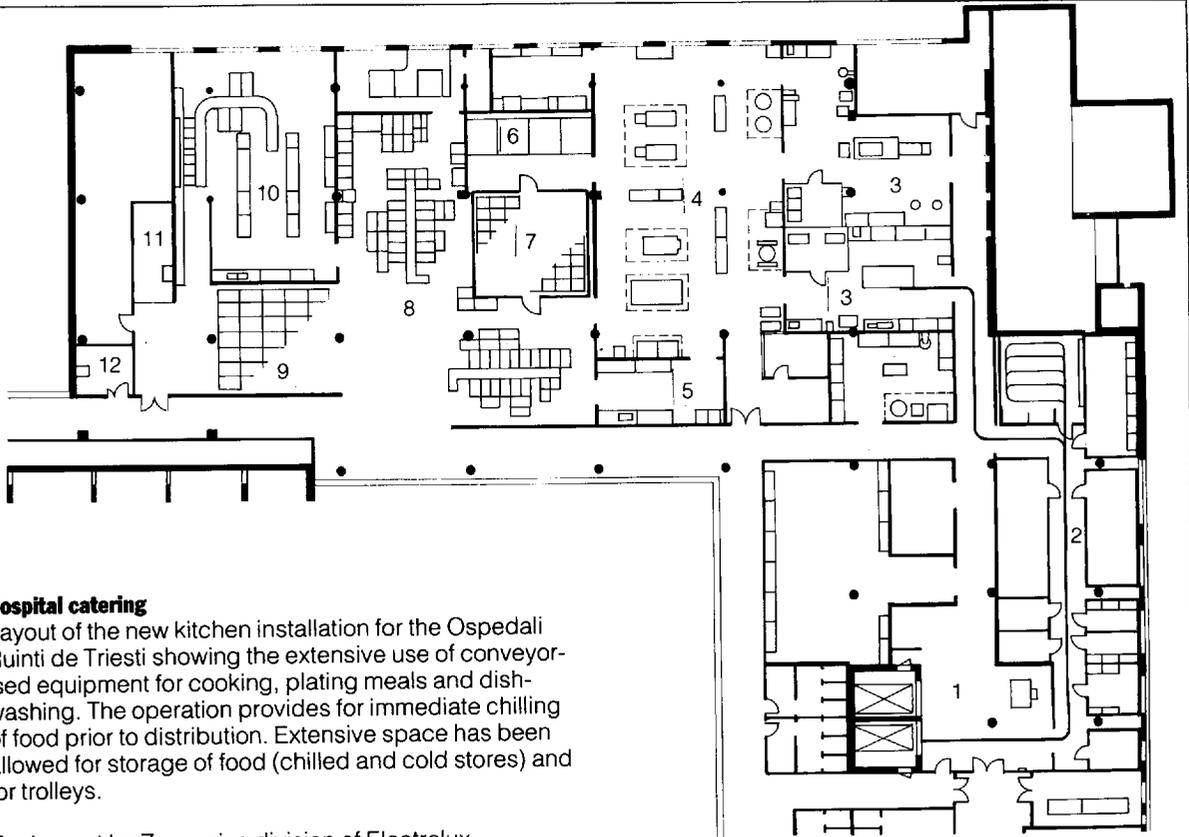


University Hospital, Mikkeli, Finland

An example of a modern hospital for 250 patients. A conveyorised tray assembly line is used with trolley distribution to wards.

Equipment: Metos Instrumentarium

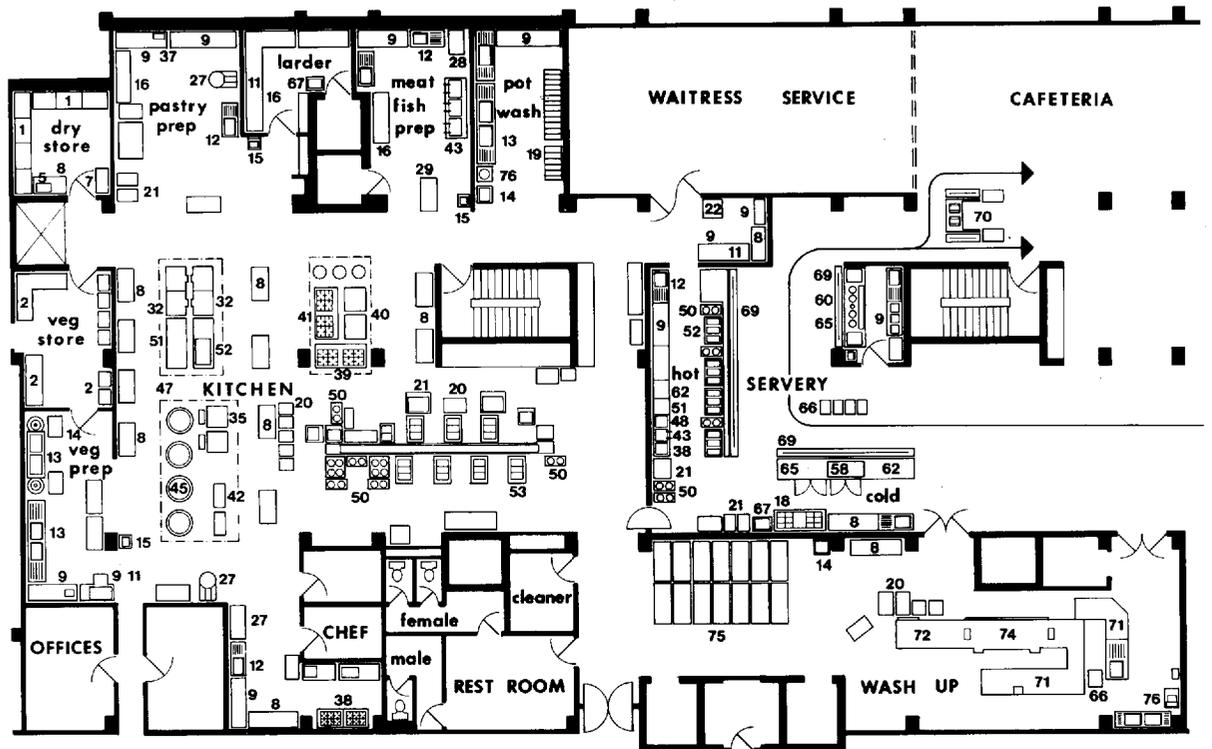
- 1 Receiving
- 2 Storage
- 3 Preparation
- 4 Cooking
- 5 Cold foods
- 6 Blast chillers
- 7 Chilled storage
- 8 Meal assembly
- 9 Trolley park
- 10 Wash-up
- 11 Trolley cleaning
- 12 Waste store



Hospital catering

Layout of the new kitchen installation for the Ospedali Riuniti de Trieste showing the extensive use of conveyorised equipment for cooking, plating meals and dish-washing. The operation provides for immediate chilling of food prior to distribution. Extensive space has been allowed for storage of food (chilled and cold stores) and for trolleys.

Equipment by Zanussi, a division of Electrolux



Hospital catering

Plan showing the layout of a typical conveyorised system used in hospital catering.

(see general key)

2.03 Standards

Guidance on standards of provisions and costs for hospital catering facilities has been given in Hospital Procedure Notes, prepared by the Department of Health and Social Security:

Hospital Building Notes No. 10 – kitchens, No. 11 – dining areas	Standards of accommodation and engineering services
Hospital Equipment Notes No. 10 – kitchens, No. 11 – dining areas	Requirements for equipment utensils, furniture and table-ware
Procedure Notes, No. 6	Department costs guide

2.04 Space requirements

The following areas are based on recommended standards but may vary with local requirements.

Functional unit	Basic accommodation		Departmental area (a)	
	net m ²	per meal m ²	total m ²	% added %
Central kitchen				
300 meals	270	0.9	345	28
500 meals	380	0.76	475	25
750 meals	475	0.63	595	25
1,000 meals	565	0.56	705	25
1,500 meals	695	0.46	870	25
Staff dining room				
125 meals	140	1.12	160	14
250 meals	230	0.92	260	14
500 meals	425	0.85	485	14
750 meals	625	0.83	715	14

(a) Includes an allowance to cover additional accommodation.

2.05 Assembled meals and centralised production

Pre-portioning and distribution of meals to the individual customer is necessary in many situations, for example:

Circumstances	Examples
Immobility due to ill health or infirmity, etc	Hospitals, institutions and welfare catering services, including meals-on-wheels to individual homes
Isolation by time	Shift workers and night staff
Isolation by distance	Employee catering for groups or individuals working in isolated areas; room service in hotels; remote services to community centres and welfare units
Restrictions on movement	Aircraft and other transport catering

In addition, the advantages of convenience speed and control provided by pre-portioning meals in advance of their requirement have wide applications in counter and cafeteria services – for example in pre-packaging cold meals, sandwiches and supplements (butter, cheese, preserves, sauces, etc).

2.06 Conditions

Distribution requirements for meals which are prepared in advance must take into account:
 — *time*: arrangements for plating or packaging; transportation facilities and distances involved in distribution,
 — *temperature*: means of regulating and maintaining temperature, moisture and other conditions affecting the food.

Direct distribution of hot food from a central kitchen is limited by time and any system operating on this basis must be highly planned and organised.

2.07 Particular features of hospital feeding services

Food commodities

Purchasing specifications and contracting requirements can be organised on a regional basis using flexible tender or cost-plus pricing. Central purchasing and cold storage may be feasible for certain commodities. As a rule the responsibility for decisions on quantity and quality of food accepted and used lies with catering management but computerised control systems are increasingly adopted (for menu dietary analysis, portion, inventory and cost control).

Menus

An element of choice is provided in most services. Optical scanning of menu cards linked to micro-computer analysis and collation of food requirements allows selection nearer the meal times and therefore minimum waste.

Central production

Large scale production of meals is facilitated but cook–chill systems using blast chillers to reduce food temperatures from 70°C to 3°C within two hours. The cycle between preparation and consumption is a maximum of three days (checked by colour coding). Special dietary foods are often frozen for longer term storage.

Distribution systems

Three main alternatives may be used:
 — assembly of individual hot meals on plates for direct transport to wards (tray assembly systems),

- reheating (regeneration) of ready prepared meals in transit to wards using tunnel micro-wave and infra-red heating with food conveyor lines,
- regeneration of prepared meals in ward service kitchens supplying a group of wards or annexe.

Production equipment

To maintain food quality the equipment should preferably be high speed, high output design to allow cooking in smaller batches and reduce the time hot food is retained before consumption. Equipment includes convection ovens, pressure steamers and pressureless moist cookers.

Location

Central kitchens are usually grouped with laundry, energy production, central stores and plant areas. For direct service, kitchens should be:

- adjacent to staff cafeterias and dining rooms,
- central for the wards (with planned circulation routes),
- linked by direct elevators to service areas on other floors.

Dishwashing

Central dishwashing, including facilities for cleaning trolleys, trays and equipment, must be provided adjacent to the production area for returning items.

2.08 Meal assembly lines

Production arrangements which terminate in the portioning or packaging of large numbers of individual meals require some form of assembly line system. Usually this takes the form of a conveyor belt or moving platform transferring trays past a series of serving points arranged at right angles in the correct meal assembly sequence.

Serving equipment (food containers, bains-marie, dispensers for plates, cutlery, heated inserts, etc), must be mobile to allow flexibility and be replenished as required.

Menus and special meal requirements must be known in advance (pre-ordering system).

Capacity

In a hospital system the maximum rate of tray assembly allowing for checking is typically eight per minute.

Areas

Based on a hospital meal service period of 1½ hours:

<i>Number of meals up to</i>	<i>Assembly lines</i>	<i>Typical areas m²</i>	<i>Notes</i>
500	1	90	Allowing for trolley space and support equipment (excluding production and dishwashing areas)
1,000	2	150	

Distribution

Purposely designed trolleys or trucks are required, with elevators or special 'trayveyors' for vertical transportation. Parking space and washing facilities for equipment must also be provided.

Food production

Standard preparation and cooking equipment may be used. Tray assembly allows food to be cooked in smaller batches or continuously. Assembly systems may be combined with central production of food for other services (staff cafeterias, etc) and with centralised dishwashing facilities.

2.09 Applications

The use of an assembly line for production depends on several factors (type of establishment, number of meals involved, time-distance of distribution), but is usually warranted for

- centralised systems of hospital meal service,
- large scale production of packaged meals such as for flight catering,
- production kitchens supplying cook-freeze or cook-chill meals.

2.10 Trays and containers

The design of trays and containers for transporting food is an integral part of the food service system:

- standard dimensions are essential to allow interchangeability or transfer to transporters, conveyors, end-cooking or holding units,
- food may be kept hot by means of an enclosed heated pellet, heated base plate or heated plate inset into an insulated tray,
- insulated trolleys are used to convey plated meals. For hot food transfer trolleys may incorporate heating elements,
- in cook-chill systems the transporting containers provide refrigeration (mechanical or cryogenic), and are interchangeable with re-generating equipment (convection ovens, infra-red cookers).

2.11 Temperature control

Unless hot food is to be distributed for immediate consumption (normally within 20 minutes) it must be prepared in shallow containers up to 50 mm (2 in.) depth for rapid chilling from 70°C to below 3°C or freezing to -20°C within 90 minutes and stored at that temperature. Insulated containers are required for distribution.

Regenerating or end-cooking can be carried out economically in small finishing kitchens or pantries each serving an area of distribution (a group of wards or annexe). A number of fast heating systems of equipment have been developed including forced air convection ovens, infra-red ovens, microwave ovens and high pressure steam ovens.

2.12 Other social and welfare feeding systems

Institutional feeding services cover a wide range of other premises including community centres, nursing homes, meals-on-wheels and centres for the disabled or confined. These may be operated through Local Authority Social Services, voluntary organisations (such as the Women's Voluntary Service) and the Ministry of Health and Social Services.

A large number of nursing homes are privately owned.

Allowing for different locations the trends are

- towards rationalisation of food production by:
- integrating services with central production units,
 - using more prepared convenience food,
 - contracting out services to specialist catering suppliers.

3. Transportation feeding services

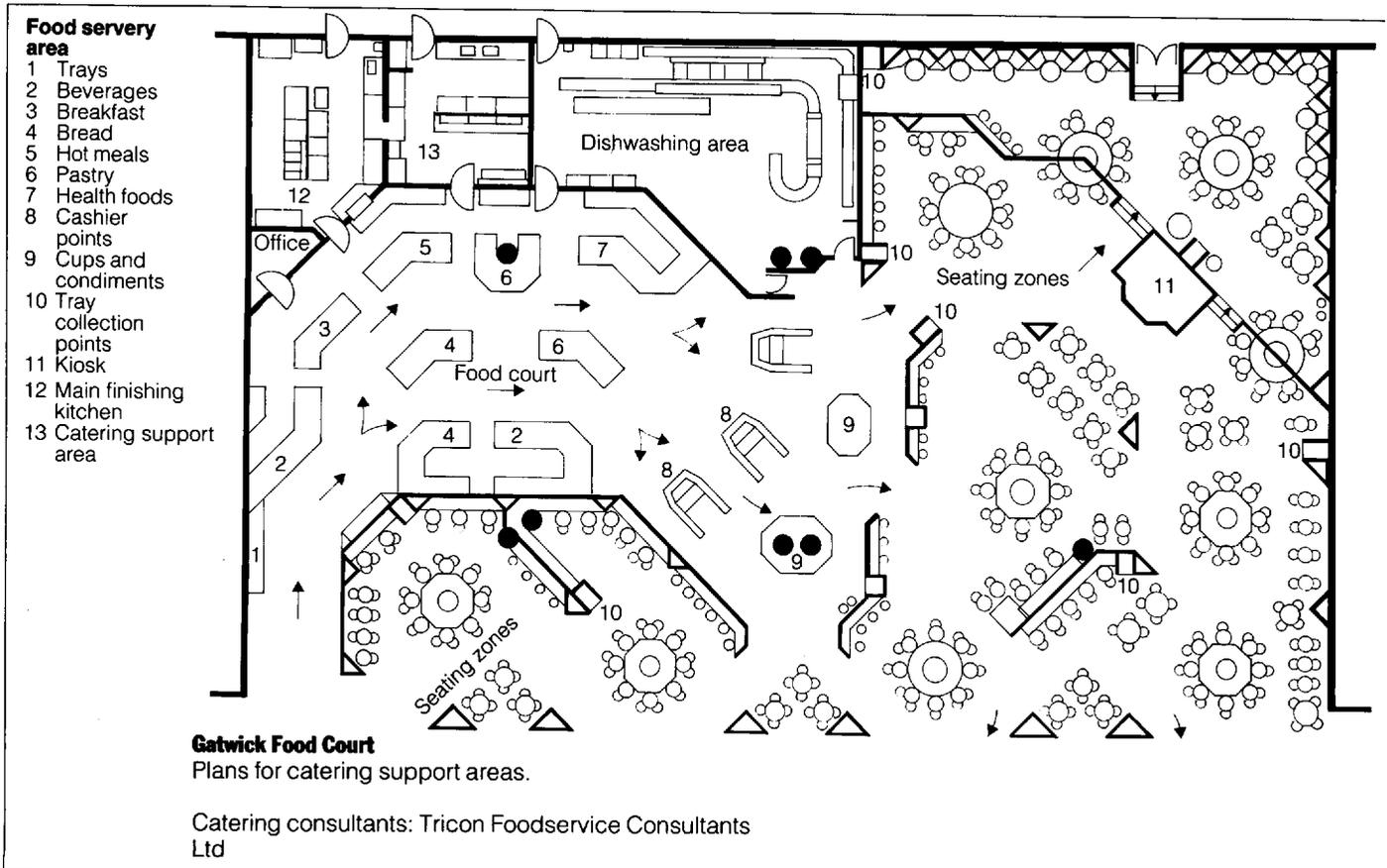
3.01 Transport catering

Food service for travellers covers meals supplied in transit and those provided at termini or stations. Airport or station catering is in many ways similar to the operation of commercial cafeterias and restaurants, although time and speed of service may be critical and catering services are usually subject to high demand.

Depending on size, airport catering will normally provide a range of services:

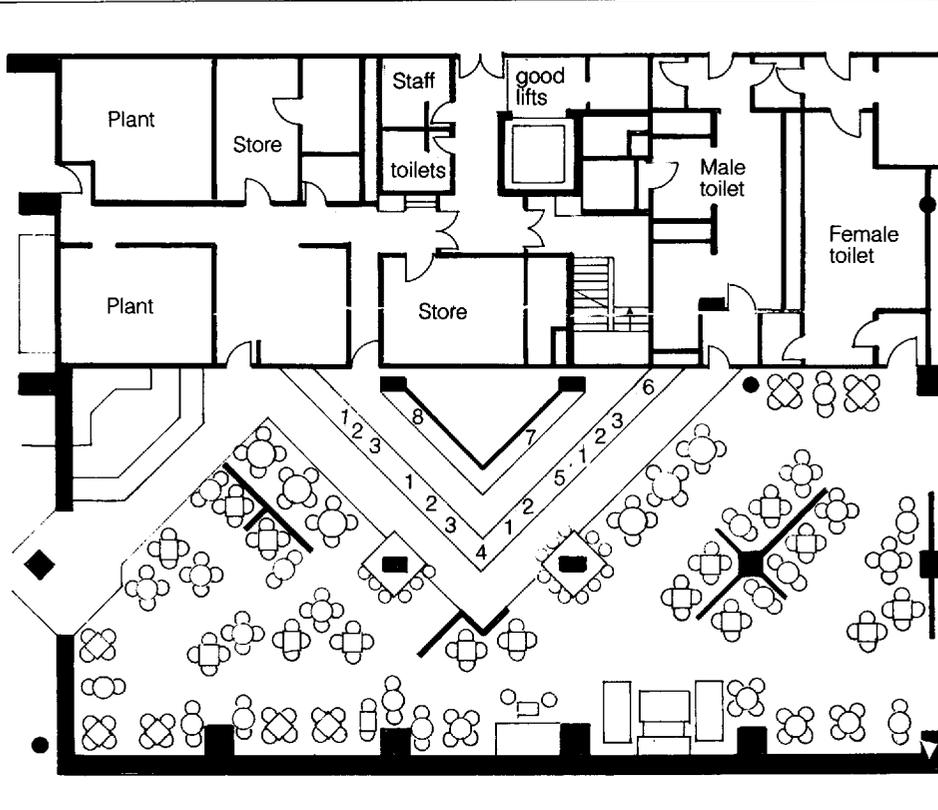
- free-flow cafeterias with multiple service and cashier points to allow flexibility for changing flow patterns,
- counter services of beverages and refreshments,
- restaurants with table service,
- employee cafeterias with vending facilities.

Similar provisions for travellers are provided in motorway catering stations but these usually include fast-food counters supplying take-away meals.



Bar details

- 1 Group bar fittings:
Cash register
Post mix
(snakehead) with
adjacent ice bin
- 2 keg taps, real
ale tap (cask)
- 3 Wash hand basin
- 4 Sink
- 5 Optics
- 6 Wine bins
and coolers



Gatwick Airport – The Village Inn

The Victorian-style design, using authentic pieces of furniture (a) such as a mahogany bar dating back to 1870 (b), has created an attractive, friendly and nostalgic environment which incorporates all the traditions of the English pub. It also provides a complete contrast to the remainder of the terminal and signals to the traveller that the area is for refreshment and relaxation.

Work on the 4,000 m² site with seating for 200 people took 4 months from receipt of brief to completion in July 1985 at a cost of £250,000.

Interior designers: Murdock Design Associates
Clients: British Airports Authority



(a)

Gatwick Village Food Court – The Country Table

To cope with up to 1,500 customers an hour, the designers created a food court with highly individual counter designs to reinforce the choice, variety and freshness of the menus. The 'wholesome' country theme is reflected in the graphic identity and choice of materials such as pine, polished brass and ceramic tiles. Careful use of colour and lighting throughout the restaurant has created the impression of spaciousness and efficiency while retaining a sense of intimacy. A choice of attractive seating layouts has been provided within the same restaurant.

Work on the 1,350 m² site seating up to 550 people began in October 1985 and was completed in April 1986.

Interior design and graphics: Murdock Design Associates
Client: British Airports Authority



(b)

3.02 In-flight catering

The expansion of in-flight catering mirrors the growth of tourism and is affected by the same economic conditions. It is also affected by the competition between airlines, the need to create a distinctive corporate style and marketing attraction for travellers within the constraints which apply.

Catering services are operated directly by airlines or by specialist contractors, many of which have developed from airline subsidiaries. The largest airline catering contractors, such as SAS Service Partner and Sky Chefs, also operate airport concessions and other diversified services.

It is usually necessary to arrange restocking at destinations to reduce the cost of transporting food for return or onward flights. Depending on locations, this may involve catering agreements with contractors or other agencies, or restocking with supplies of stored frozen food.

3.03 Planning framework

Catering services for passengers and crew in transit are subject to a number of particular constraints.

Food selection and packaging have to allow for changes in temperature and pressure, the handling and consumption of meals in a confined

space, individuals' aversions to strong flavours, cultural, ethnic, religious and time differences, cost limitations and the need for a varied and attractive presentation of food. Market research is necessary to forecast the strengths of food choices, to reduce waste and to respond to consumer preferences.

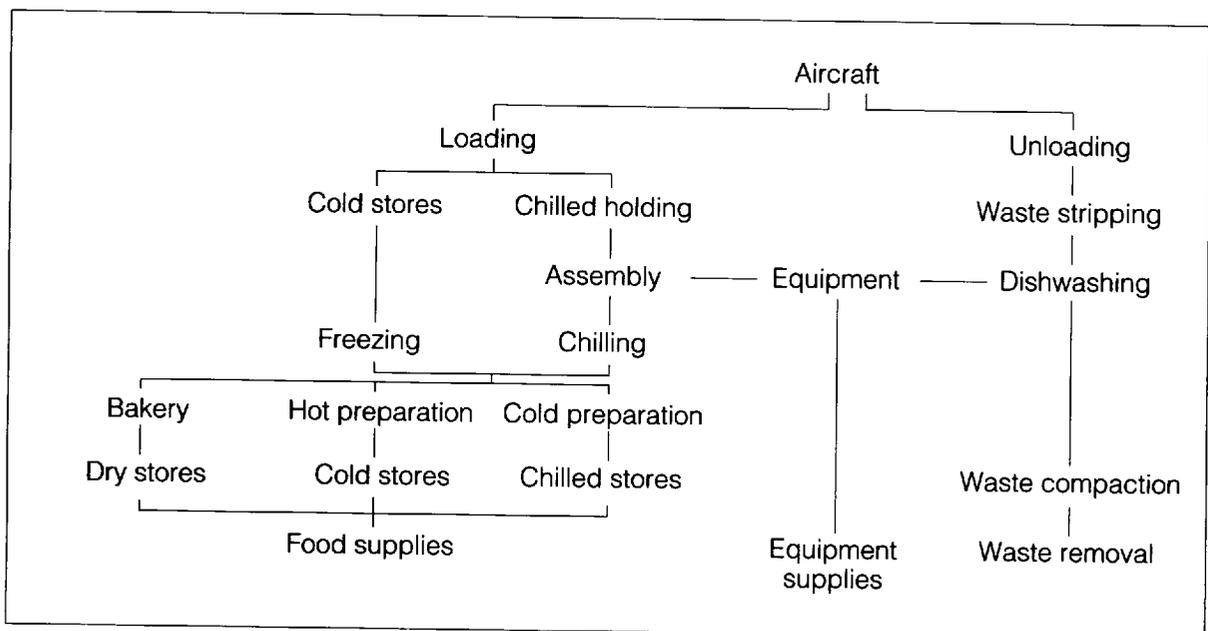
Containers for airline meals have to be attractive, unbreakable and stackable. To a large extent, containers are recovered, washed and re-used in the base catering unit.

Stowage and galley areas are located in stressed parts of the aircraft with payload and space restrictions.

Galley designs and equipment vary with the types of aircraft and operating requirements, but the food trays and racks must be interchangeable between containers, ovens and serving trolleys to allow for easy transference. Restocking containers need to be compatible with those on the aircraft.

Meal planning involves advance programming of the days, times and types of meals required for each aircraft, together with details of the special equipment and containers. Meals have to be assembled in a chilled holding room ready for loading immediately prior to departure. Food not required for immediate use is blast frozen for cold storage.

The base production facilities must be planned as flow systems:



The circulation routes must be planned for truck and conveyor transport and holding stores are designed for the pallet racking of containers.

For high production levels, continuously operating cooking appliances are required in large scale kitchens to enable the output to be geared to the meal assembly line. This usually includes conveyorised broiling equipment and rotary ovens, in addition to boiling pans, bratt pans, fryers and griddles. By-passing arrangements for cold preparation (about 50 per cent of the food) and a separate bakery section are also usually required.

Meals are normally assembled on circulating conveyor belts supplied with trays and wrapping machine. Preparation tables are mainly mobile to allow transfer and positioning in suitable work centres.

For loading, narrow bodied aircraft normally have front and rear galleys adjacent to the doors which can be stocked from hi-loader vehicles. Wide bodied aircraft typically have five galleys which are fitted with self-contained roll-on, roll-off storage units to allow complete replacement. For a turnaround time of 45 minutes, the aircraft must be fully restocked in about 20 minutes.

In-flight service of meals must be highly organised, following set procedures. In narrow bodied aircraft, meals are usually distributed by tray from galley racks and in wide bodied aircraft by trolley with the hot meals in an insulated compartment.

Clearing of trayed meal waste may be fully automated, the cutlery being removed magnetically, paper and debris blown off and the trays conveyed through the washing machine prior to sorting for re-assembly.

3.04 Rail catering

British Rail catering services operated by Travellers' Fare provided, in 1984, some 360 station units in 180 locations ranging from full service restaurants, bistros, licensed bars and buffets and fast-food operations (Casey Jones) to tea bars and confectionery kiosks.

Rail catering covered over 800 on-train restaurant and buffet cars, having purposely designed rail galleys fitted with storage and cooking equipment. Catering rail stock is usually based on a ten year working life and the latest models incorporate automatic fast heating equipment, including microwave ovens and griddles. Sixty-three new catering coaches entered service in 1986-7.

Although station catering is generally profitable, on-train services mainly operate at a loss because of the high staffing and overhead costs. The trend is towards rationalisation, providing a limited buffet and trolley service supplied with chilled food prepared in line-side catering centres. Airline-style meal packs are also being widely introduced.

3.05 Ferry transport catering

The type of food services provided on large passenger ferries depends on the length of journey, number of passengers, extent of competition and marketing strategy of the operator.

For routes crossing from Great Britain to the Continent, a typical ferry with 1,300 passengers would provide a 150-seat cafeteria, plus a 50-seat restaurant with waited service or a 250-seat cafeteria. In all cases one or two bars would also be available.

In view of time and space restrictions, catering is mainly based on prepared convenience meals requiring extensive refrigerated storage and high speed regeneration and cooking equipment fitted into galley areas.

3.06 Cruise liners

Cruise holidays provide full board accommodation in which the meals and service are often an important part of the travel experience. The planning of catering services is broadly similar to that for hotels but must take into account the operating conditions:

- large stocks of food and wine requiring refrigerated storage, including special diets and ethnic variations,
- arrangements for rapid revictualling at ports of call,
- range of restaurants, bars and coffee shop arrangements and their locations,
- design of catering equipment for fitting and stowage requirements.

4. Educational catering services

4.01 Organisation

Educational catering services cover a wide range of establishments from universities, colleges and training institutions to schools (state or private) and provide mainly midday meals or full residential catering.

Public sector services are subject to legislation which lays down a framework for the administration, provision and financing of catering. Standards, cash limits and other design guidelines are normally regulated by the authorities concerned, either directly or through advisory notes.

Private institutions are bound by conditions of registration in addition to more general legal requirements for standards of food and hygiene. In 1984, catering services in schools and, increasingly, in colleges and universities were affected by static or falling enrolment, increasing costs and changes towards more selective application of subsidies. The same trend is reported in the United States as well as in most Western European countries.

4.02 School meal services in Great Britain

Administration

Catering services in State primary and secondary schools in England and Wales are administered by some 104 Local Education Authorities under the Education Act 1980. The Authorities are largely empowered to administer the services as they see fit, subject to compliance with statutes and regulations including competitive tendering. Active consideration is being given to adoption of Continental school hours.

Advisory services

The Department of Education and Science provides advisors generally to oversee catering services. Under earlier administrations, guidelines were issued on building layouts, equipment requirements, staffing and nutritional standards.

Operation

School meal services are usually coordinated by a relatively small number of professional staff operating with mainly part-time cooks and assistants. The levels of changes, cost limits and subsidies are set by Local Authority budgets.

Scale

Some 8.1 million pupils attended State schools in England and Wales in 1984. As a national average, 36.8 per cent purchased a school meal, 8.5 per cent were entitled to a free meal (under the Education Act provisions) and the remainder brought food to school. These percentages vary with the local circumstances and policies. School meals traditionally provide two courses, usually with a cyclical pattern of 20 days which covers a set range of food items.

The total UK expenditure on school meals and milk in the year 1983–84 was £520.2 million.

4.03 Rationalisation

To meet cost targets and improve participation rates, many school meals services have been extensively reorganised with particular emphasis on the following:

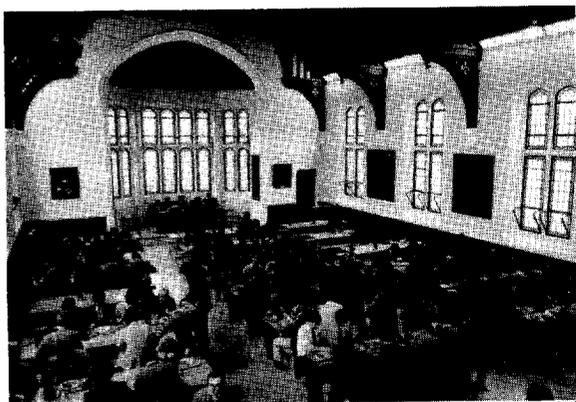
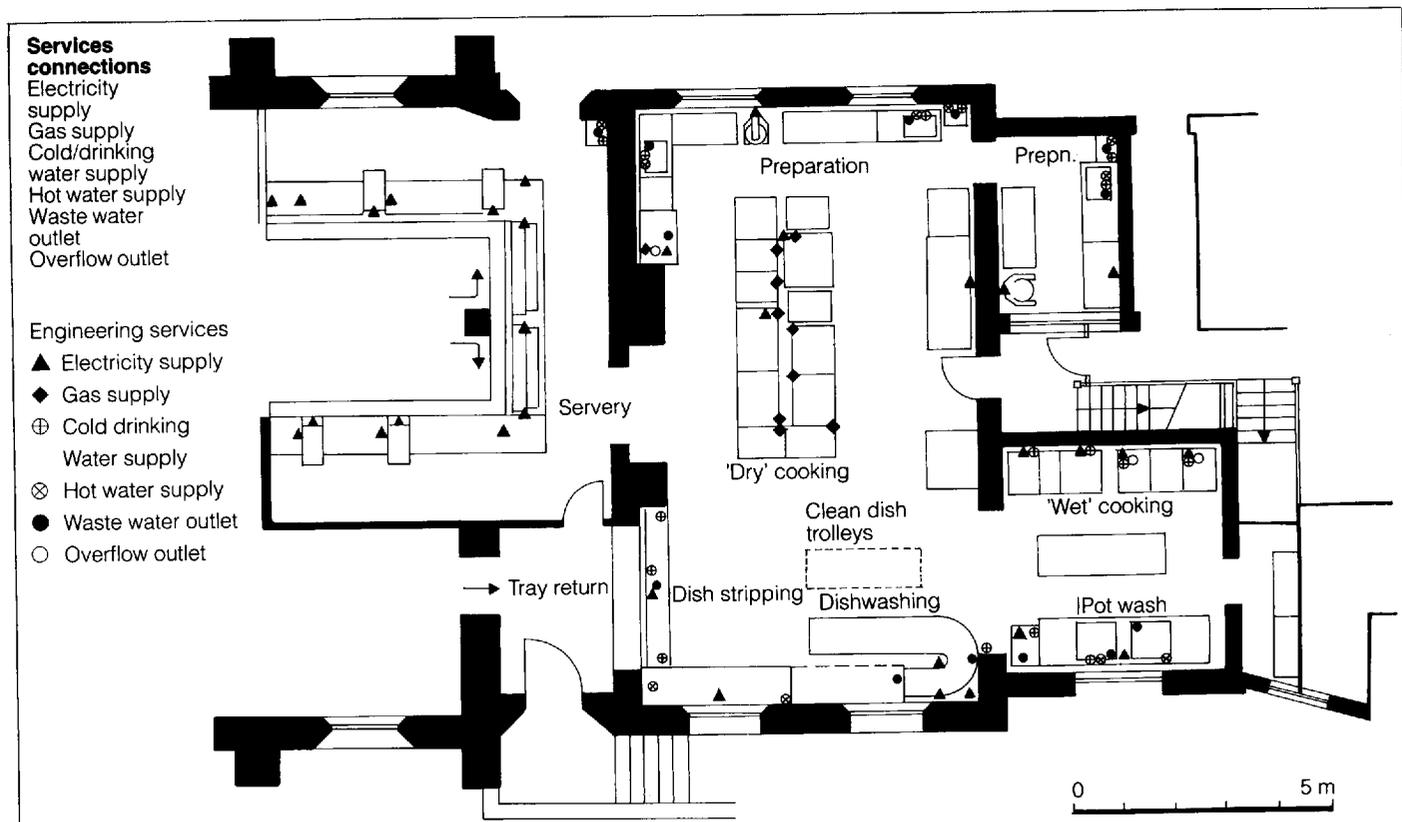
- centralisation of production with integrated distribution of prepared fresh, chilled and frozen convenience food to achieve the required economies of scale and rationalisation. It is often practicable to combine this with other social and welfare services to community centres, institutions and meals-on-wheels to individual homes (see Chapter 8, section 1),
- reductions in the numbers of kitchens and staff,

- changes to cash cafeteria services with self-selection of food to improve participation rates,
- variations in menu style and content, including changes in the cyclical patterns of menus,
- active promotion of school meals through advertising campaigns, improved displays of food and more attractive dining areas,
- control of food quantities and portions by means of central purchasing and specifications, together with computerised recipe files providing analyses of food costs, gross profit percentages and selling prices,
- organisational improvements, using management information systems to monitor sales, prices, labour and overhead costs, productivity ratios, and subsidies.

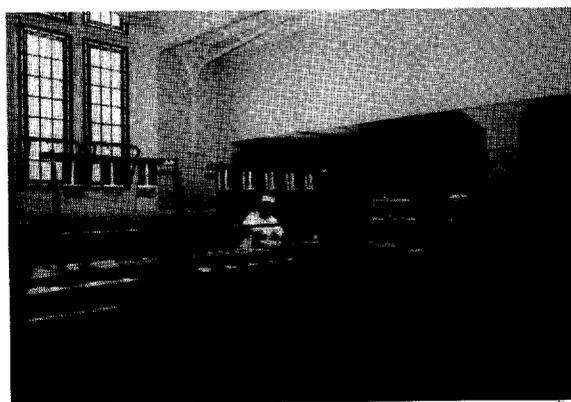
The extent of subsidy on school meals depends on the policy of the Local Education Authority and socio-economic factors. Some authorities budget for sales to cover all food and direct labour costs, plus a contribution towards catering overheads. In others, subsidies of 40 per cent or more of total expenditure are given.

4.04 Private schools and colleges

In Great Britain, about 8 per cent of all schools and colleges are independent of the State system and many of these are boarding establishments which provide pupils with three main meals a day. Schools in the private sector usually operate their own facilities to allow direct control and flexibility, but some employ caterers to supply and manage their catering requirements.



(a)



(b)

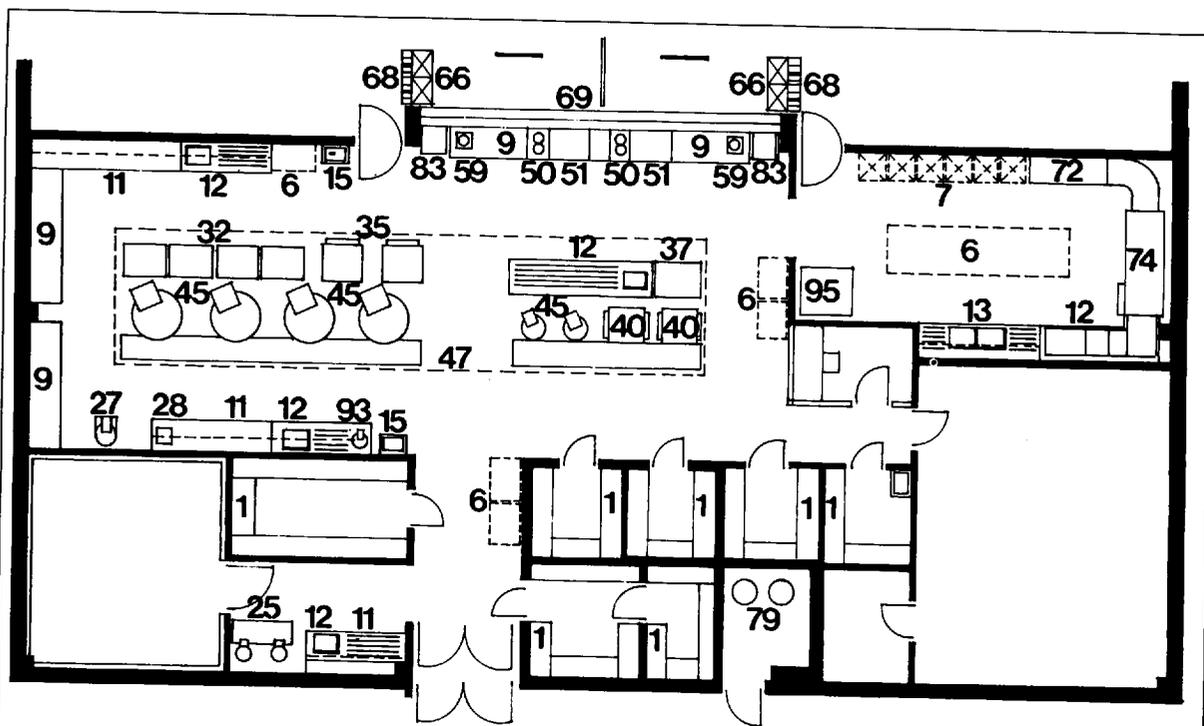


(c)

Leys School, Cambridge

To serve the 400 boys with meals within 40 minutes (a), a new servery has been provided on the first floor (b) with an adjacent modern kitchen (c). This includes two specially designed cooking suites, one for boiling and steaming, the other for roasting, frying and grilling. The contract cost (1983) was £80,000.

Equipment suppliers: G. F. E. Bartlett and Son Ltd
 Contractor: Coulson and Son Ltd



Central kitchen for schools, Aänekosken, Finland
 Arrangement of a kitchen and servery designed (late 1977) to provide 2,300 meals once a day. Serving counter is augmented by mobile distribution trolleys. Special facilities are provided for washing trolleys and containers.

Equipment: Kopal Oy, Helsinki

(see general key)

4.05 Universities, colleges and training institutions

Standards of facility provision, including cost limits, are generally laid down by the funding agency and, as a rule, space and equipment requirements are based on the numbers of full-time equivalent students.

4.06 Universities

British universities are centrally funded through the University Grants Committee which provides both capital and recurrent grants towards expenditure. Current policy is towards greater flexibility in the way allocated finance is used and independent funding of non-academic services. With static growth in university enrolment in 1984-5 and the need for stringent economies, there has been minimum investment in catering facilities. The norms for planning university dining and kitchen areas may be summarised as follows: *The maximum meal demand* (usually at weekday lunch).

This rarely exceeds the total student numbers and may be considerably less. A typical provision is 75 per cent of the equivalent full-time student population.

The pattern of demand

The demand for different types of meals will also vary but are normally in the following proportions:

Type	Examples	% of meals served
Main meals	Meat and two vegetables	40
Snacks	Egg and chips, beans on toast	35
Hand snacks	Coffee and sandwich, pie and pint	25

Dining areas

Depending on the types of meals provided, dining rooms should be based in the following areas:

Type of dining room	Area/dining place,		Times used each meal time	Gross area/meal served m ²
	-usable m ²	-gross (a) m ²		
Cafeteria	1.1	1.65	2.5	0.67
Snacks	1.1	1.65	2.5	0.67
Waitress service	1.1	1.65	1.5	1.10
Formal dining	1.1	1.65	2.0 (b)	0.85

(a) Including a balancing allowance of 50 per cent on the usable area.

(b) With coffee service in separate lounges or common room.

Kitchen areas

Calculations of kitchen areas are also based on the types of meals provided;

Type of meals provided	Kitchen area/meal	
	-usable m ²	-gross (a) m ²
3 main meals including breakfast	0.45	0.68
1 main meal/day	0.40	0.60
Cooked snack meals	0.30	0.45
Coffee sandwich service	0.10	0.15

(a) Including a balancing allowance of 50 per cent on the usable area.

Cost rates/unit area of building

The allowed rate/m² for building, including floor finishes and normal engineering services may be stipulated.

Unit allowances for furniture and fittings

Expenditure limits based on the number of meals/day may be set for heavy kitchen equipment, additional light kitchen equipment, dining-room equipment and furniture and for crockery and cutlery.

4.07 Colleges and other institutions

Capital and recurrent finance is normally provided by the Local Authority or the Department of Education and Science. Conditions and standards are broadly similar to those for universities.

4.08 Trends in institutional catering

Partly in response to economic constraints, but also reflecting the general trend towards lighter informal meals, the main changes in catering for tertiary level education are towards:

— introduction of fast-food sections,

— alternative health foods, self-service salad and vegetarian bars,
 — rationalisation in food production with greater use of convenience foods and systematised production,
 — introduction of management information systems to improve control and accountability,
 — greater discretion and flexibility in the way universities and colleges allocate internal expenditure.

4.09 Institutional feeding services in the United States

Based on the annual surveys of the National Restaurant Association, over 20 per cent of the total projected food and drink sales in 1984 were from institutional premises.

	1984 % of sales	1981-4 compound annual growth
Commercial feeding establishments	79.6	9.0
Food contractors	5.7	6.7
Institutions operating their own food services	14.2	6.0
Military feeding	0.5	8.3
TOTAL SALES	100.0	7.5

Compared with commercial feeding, institutional services experienced relatively little growth in the period 1981-4, particularly employee feeding (economic recession), educational feeding (falling birth rates) and community centre services (economies in social programmes). Cost-cutting measures and rationalisation also affected sales in health care establishments.

A high rate of increase in sales was recorded in in-transit services for airlines and in transportation feeding generally.

Food contractors provided over 40 per cent of the sales in institutional feeding (excluding military services) in 1984 and the expansion of contract-

ing is increasing in practically all sectors.

<i>Food contractor sales for</i>	<i>% of total</i>
Employee feeding	63.6
Educational feeding	29.2
Transportation feeding	45.4
Health care feeding	8.6

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3. Marketpower Survey, 'The Industrial Catering Market,' reported in Sutton, A., 'Large scope for growth in staff restaurants,' *Industrial Caterer*, September/October, 1986.
4. NRA News, 1986 Food Service Industry Forecast, December 1985, pp. 11-34.
5. Horton, A., 'Successful new catering methods for hospital feeding', Cost Effective Catering Conference, Electricity Council, 1982.

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With changing social and living habits creating an increasing demand for meals to be taken away from the home, investment in restaurants is taking place on a massive scale throughout the world. Restaurant design is also constantly evolving as changing fashions and competition demand more frequent refurbishment and reinvestment coupled with technical advances in food production and equipment.

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Dr Fred Lawson is Visiting Professor at the University of Bournemouth and an international consultant on hotel, tourism and food service facilities. Qualified in several professions he has led many national research programmes and has written nine architectural books, including 'Hotels and Resorts' published by Architectural Press. New books on 'Tourism and Recreation Facilities' and 'Conference, Convention and Exhibition Facilities' are due for publication in the future.

Cover photographs

QUAGLINO'S RESTAURANT

Interior designers: Sir Terence Conran, Keith Hobbs and Linzi Coppick

GRILL ROOM, DORCHESTER, LONDON

Interior Designers: Richmond International

CANTINA DEL PONTE, LONDON

Interior Designers: Sir Terence Conran, Keith Hobbs and Linzi Coppick

AMBROSIA CAESARS

Interior Designers: D Leonardo International Inc; Photograph: Warren Jagger

LESLIE AND GOODWIN, FARNBOROUGH

Architects: Arup Associates



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