KING EDWARD'S

HOSPITAL FUND FOR LONDON

HOSPITAL CATERING ADVISORY SERVICE

LAYOUT AND DESIGN

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LAYOUT AND DESIGN

Whenever alterations or improvements are to be made to the Catering department of a hospital either by extensions, new building, or installing new equipment, it is essential that all work is done to a detailed plan. The preparation of accurate drawings is usually undertaken by an Architect or Draughtsman, who co-ordinates information and instructions from a number of Hospital Officers, and produces recommendations in plan form for their consideration and approval.

This circular is intended as a guide when such plans are being prepared by hospitals and may also serve to assist those who are required to furnish information to architects or consultants.

The installation of new items of equipment, or replacements necessitating an alteration within one section of the catering department, are often made without reference to the layout as a whole. This invariably results in a disjointed layout that is not based on time and motion study, and frequently further alterations have to be made to meet complications that were not foreseen at the start.

This circular deals with the planning of the catering department, the fundamental principles of which are classified under the following headings:—

(1) Basic factors.
(2) Facts and figures.
(3) Preliminaries to planning.
(4) Planning.

1. BASIC FACTORS.

The factors involved in planning hospital catering departments differ from those which apply in other spheres of catering. Although each project demands individual consideration, meal times, service of meals, and catering staff are constant factors in every planning problem.

(a) MEAL TIMES. Meals have to be provided at set times, necessitating arrangements for "bulk production." Whereas this condition is present in many catering departments at factories, etc., in hospitals the set times for the service of meals and beverages range over a far longer period, commencing early in the morning and terminating with the supply of a cooked meal for the night staff. This factor has a considerable bearing on the type of apparatus and equipment to be installed and affects the layout of the various sections within the catering department.

(b) SERVICE OF MEALS. Whereas the type of service to be planned for patients and staff will depend mainly upon the classification and size of the particular hospital, the kitchen and serveries will need to be designed to meet the following requirements:—

(i) Service to Bed Patients.
Individual service based on a ward kitchen with suitable trolley facilities.

(ii) Service to Ambulant Patients.
Cafeteria or waitress service dependent upon numbers and type of patient.

(iii) Service to Resident Staff.
The type of service to be provided will depend upon the numbers in each category of staff, and whether in the hospital in question these categories are to eat together or separately.

In small hospitals when it is necessary to separate different grades of staff, this may be achieved by the timing of meals rather than by the provision of separate dining-rooms.

In larger hospitals separate dining accommodation may have to be considered for Sisters, Nurses and other categories. As a planning principle this should be achieved preferably by the partitioning of one large dining-room, in which case one common servery should be provided.

If possible, the servery should be so designed and equipped so that either a waitress or cafeteria type of service can be employed. Although a waitress service is more often required there are advantages in providing the alternative type of service at mid-morning and when the dining-room is used for special functions.

(iv) Service to Non-Resident Staff.
The provision of separate dining-rooms for different categories of non-resident staff is not recommended, as it can cause difficulties especially in connection with the distribution of meals from the kitchen, and necessitates the employment of additional catering staff. It may also lead to the provision of a number of small serveries sited and approached from different sides of the kitchen, and this creates further difficulties in planning on account of the unavoidable cross traffic so created. As a planning principle, there should be one canteen for all non-resident staff, basically designed for a cafeteria style service. If separation is required and cannot be achieved by the timing of meals, this should be obtained by partitioning, when the possibility of providing a waitress service for higher categories can also be considered.

(v) Service to Out-Patients.
The service of refreshments in the out-patients' department is best provided by means of a snack bar or trolley.

(c) CATERING STAFF. In all planning due attention should be given to the degree of efficiency that it is reasonable to expect from the personnel employed.

There is a serious shortage of trained staff in hospital catering departments and one of the reasons for this may be the poor conditions under which this staff often has to work.

It is stressed that the layout and design of catering departments should include those reasonable facilities which will attract and retain efficient staff. Adequate dining, changing, washing and toilet facilities are essential.

2. FACTS AND FIGURES.

Those who are to produce plans must have a wide experience in the field of catering engineering. They must know many details of the hospital, but owing to the fact that each project requires individual study, it is not generally desirable for a set questionnaire to be used except in the case of a new hospital. The details are best acquired at the hospital, where it is easier to obtain the "atmosphere" of the project, which is so necessary if a successful layout is to be achieved.

The following remarks, although phrased to relate to existing premises, are also applicable to new projects. They can therefore be utilised as the basis for preliminary discussions or the submission of a questionnaire in connection with the design of new hospitals.

(a) TYPE OF HOSPITAL.

It will be necessary to know whether there are tuberculosis, infectious diseases or children's wards, etc., and whether the hospital is for general, chronic sick, Part III or mental patients, etc., as each type of hospital calls for some variation in layout and design. All possible data should be obtained, including the average number of therapeutic diets provided. The numbers to be catered for and the type of patients are factors which often decide whether more than one kitchen is desirable and if a separate diet kitchen is necessary.

(b) LOCALITY OF HOSPITAL.

This must be considered as it may affect the fuel to be recommended for the necessary apparatus

The location of the hospital, both geographically and in relation to other hospitals within the group, may also have a bearing on the size and layout of storage accommodation.

(c) NUMBERS TO BE CATERED FOR.

(i) The number of beds.
(ii) The number of wards.
(iii) The number of dining-rooms.
(iv) The factual numbers for each category of staff taking advantage of the existing catering facilities, especially at the time of the peak load (*i.e.*, the mid-day meal).
(v) Any known future increases in the numbers to be fed.

This does not mean that every kitchen should be equipped initially with apparatus to cover any substantial future increases, but if the site is suitable the knowledge of these increases will enable consideration to be given and space allowed for the future installation of additional apparatus. This knowledge will also enable the various sub-sections of the kitchens, such as preparation rooms to be planned to deal with future maximum numbers. It is far more economical to provide sufficient benching, fitted sinks and drainers, etc., in the first instance than to alter these at a later date.

When there is a large number of non-resident staff it may be desirable to provide a canteen equipped with its own kitchen and run as a separate unit.

(d) ADMINISTRATIVE DATA.

(i) Number of sittings in dining-rooms necessary to conform with internal staff administration and details relating to numbers of night staff.

(ii) Details of the existing catering organisation, including those which apply to goods reception and the relation-between:—

(a) Main stores and kitchen.
(b) Main stores and ward kitchens.

3. PRELIMINARIES TO PLANNING.

There are two distinct types of plans:—

(A) The New Project.
(B) Alterations to Existing Premises.

Each case demands individual study and the following points are therefore intended for general guidance only and the implied principles should be adapted to meet the peculiarities of each hospital.

Before drawings can be commenced it will be necessary to review the project as a whole and to analyse and discuss the following preliminaries:—

(A) THE NEW PROJECT.

(i) The facts and figures required under heading 2 should be studied and an assessment made of the general catering requirements and overall area necessary to provide them.

(ii) The aim should be to obtain in plan form a balanced and high degree of efficiency in each section of the catering department. It is better to reach, say, 85% efficiency in each sub-section than to achieve complete theoretical efficiency in some departments at the cost of reducing seriously the efficiency in others. These latter departments would invariably cause "bottlenecks" and reduce the efficiency of the entire layout and output from the kitchen.

(iii) The preliminaries of planning a catering department in a new hospital commence at a less defined stage than in cases where an organisation already exists. The layout of the catering department cannot be isolated from other departments within the hospital and complete co-operation should be established with the architect at the earliest opportunity. The following factors will influence the selection of the site for the catering department:—

Accessibility—with reference to the reception of goods.

Centralisation—for purposes of distribution.

Location—with reference to services, drainage and ventilation.

The arguments in favour of siting kitchens on the top floors of multiple storey hospitals, where natural lighting and ventilation are more easily provided, are dependent upon the provision of separate lifts connecting the kitchens with the main provision stores or unloading bays and the refuse and swill areas on the ground floors.

On the other hand and especially where staff dining-rooms are located on the ground floor, modern mechanical ventilation can help to overcome the drawbacks of ground floor kitchens.

(iv) When more than one kitchen is required, each kitchen need not necessarily be self-contained, and it may be desirable to centralise certain departments within a particular kitchen. (For example, a pastry section may be sited in one kitchen block and a centralised vegetable preparation department in another.) When a single kitchen is to be provided and large numbers are involved, the kitchen may be divided into sections, and when applicable separate cooking areas allocated for:—

(a) The preparation and cooking of therapeutic diets.

(b) Pastry preparation and cooking.

(c) Vegetable preparation and cooking.

(v) After giving careful study to the particulars detailed above, and having envisaged the general requirements of the catering department, it will then be possible to estimate details of the apparatus, equipment and machinery needed so that the preliminary drawings can be commenced.

(B) ALTERATIONS TO EXISTING PREMISES.

Plans for alterations may be placed in two categories:—

(i) Major Alterations.

Although this type of drawing should avoid costly structural alterations, which can be overcome by alternative means, it should be planned boldly, and should incorporate any extensions to premises which may be desirable.

(ii) Minimum Alterations.

This type of drawing should depict what is essential and should aim at the provision of all reasonable catering facilities. Any financial restrictions should be given special consideraton. Existing items and services should be utilised wherever possible and every effort made to avoid extensions to the building.

Before drawings of either type can be commenced, the following preliminaries should be completed:—

(i) The facts and figures already referred to should be studied in relation to the facilities, etc., provided by the existing premises. Present procedure and systems which may have been in operation for so long that they are inclined to be considered unalterable, should be reviewed critically together with the more obvious problems.
The aim should be to reach an early decision as to whether alterations can be carried out successfully within the available area, or whether extensions or considerable modifications are required, *i.e.*, whether a "major alteration" or a "minimum alteration" drawing is to be prepared.

(ii) Details should be obtained of all existing apparatus, equipment and machinery, etc., so that a complete assessment can be made of what is needed, both existing and new items. The type of scheme will affect the choice between new and existing items. For example, it may be necessary to recommend the re-installation of certain existing items in a scheme of minimum alterations, whereas new items would be highly desirable if sufficient funds were available.

(iii) If extensive alterations are envisaged, it will be necessary to consider what alternative arrangements can be made to maintain essential catering activities during the time such alterations are being put into effect. Although a detailed "programme of work" cannot be prepared until plans can be studied by the hospital architect or engineer, it may be possible to reach a broad agreement during preliminary discussions. For example, in a hospital having more than one kitchen block, it may

be possible to agree on the temporary closing down of one block for alterations during a favourable summer month. Usually it will be necessary to undertake the work of installation in stages, although undue staging will increase the total cost of the completed scheme.

(iv) Those existing conditions and structures and the arrangement of drainage, services, etc., which are considered unalterable, should be used as the basis from which the plan can commence. These conditions will invariably determine the manner in which the kitchen or kitchens can be divided into sections.

(v) The aim should be to obtain a balanced layout throughout all sections of the catering department as detailed under heading 3 (iii).

4. PLANNING.

The following data refers to alterations to existing premises, but the general principles also apply to new projects.

(i) An accurate plan of the catering department should be available. In cases when architects' drawings of the existing premises cannot be found, time and trouble has to be wasted in preparing scale drawings from sketches obtained on site.

When drawings showing the proposed alterations are submitted to the hospital, it is of great assistance if a plan of the existing layout is available for study along with the plan of the proposed alterations, and, if size permits, incorporated on the same drawing. Colours should be used to emphasise salient points. The main changes proposed will then be more readily apparent to all who have to study the plan.

(ii) Before planning can proceed a separate study should be made of the type and capacity of the apparatus and equipment required within each sub-section of the catering department.

(iii) Drawings showing alterations should be based on the true to scale position of all structural walls, but other details such as equipment, new partitioning, etc., can be drawn "in the rough" in the first instance.

(iv) Bearing in mind all previously mentioned points, the first aim in planning should be to avoid detail and to plan in terms of rooms and departments, experimenting with alternative methods for linking these together to form co-ordinated "flows" based on a time and motion study throughout the sphere of the catering department.

As the catering department of any hospital can be likened to one link in a network of communications, there may be a certain amount of cross-traffic throughout the hospital which will affect the layout and disposition of the sections within the catering department. The aim should be to create a scheme which will not interfere with other hospital traffic. Within the catering department itself the layout of the various rooms or sections should be based on the following three main flows, which should be read in conjunction with the accompanying diagram facing page 8.

(a) Flow of goods from "Stores" or "Goods In," through preparation areas into kitchen and so on to the point of service (as shown in red on the diagram).

(b) Flow of distribution from point of service, via trolleys if applicable, to ward kitchens and staff serveries (as shown in green).

(c) Flow of "dirties," "empties," and "swill" (as shown in blue). This flow is in the reverse direction to those above and can be sub-divided as follows:—

(i) Soiled crockery from dining-rooms or wards back to washing-up sections and on to service points for re-use (in the case of wards, washing-up facilities are invariably provided within the ward kitchens).

(ii) Soiled utensils from cooking and preparation areas to utensil wash-up and so on to storage racks pending re-use.

(iii) Empties, swill and refuse from kitchens, serveries and preparation areas back to where proper facilities should be provided for these items.

It should be noted that (a) and (b) are very closely linked and (b) and (c) (i) together form a definite cycle of events.

Similarly, but to a lesser degree, (a) together with (c) (ii) and (a) with (c) (iii) form other cycles of events, and one object of planning is to co-ordinate these, avoiding as much cross-traffic as possible.

In addition to the many sub-sections of the catering department which come within the spheres of (a) (b) or (c) there are others which, although not strictly within these basic flows, have a defined position within the layout as a whole. For example, rooms to give catering staff changing, washing and toilet facilities should be sited preferably near to the staff entrance into the kitchen, and there are advantages in siting the chef's or supervisor's office to overlook kitchen and/or main service point.

These particulars are indicated on the diagram and may serve to illustrate the importance of time and motion study when preparing layout drawings. The different sections, although typical, are not intended to represent the requirements of any specific catering department or a set number of meals.

The results of a time and motion study will also indicate which operations are best carried out within separate rooms.

In the catering department of a large hospital it will be necessary to provide a number of separate rooms in which certain work can be done without interfering with the more general activities in the main kitchen.

The opposite applies to the small unit requiring only a small staff for successful operation. Separate sections should then be kept to a minimum, so avoiding needless walking from room to room, but with the three main "flows" still retained by the correct siting of equipment.

In the smallest kitchen the use of partitions should be restricted, as these are inclined to create small recesses or bays which are difficult to clean, but when necessary they should be designed so as not to obstruct any natural light.

To summarise this aspect of layout and design, whether a large catering department has twenty separate sections or a small catering department twenty separate items of equipment, the layout in each case should conform to a definite scheme. The following schedule is intended as an example of the manner in which a number of separate sections can be reduced according to the size of the project. It is again emphasised that as there are satisfactory variations to the illustrations shown, each catering department should receive individual study. A separate room for the sterilization and storage of milk containers has not been included as it is considered more hygienic to provide bottled milk for the ward kitchens.

SECTIONS WHICH MAY BE CENTRALISED.

Trolley Bay	Trolley Bay	Kitchen
Kitchen Supervisor's Office	Kitchen Supervisor's Office	Kitchen
Main Kitchen Steam Kitchen	Kitchen	Kitchen
Pastry Kitchen Pastry Preparation	Pastry Section	Kitchen
Utensil Wash-up Utensil Store	Utensil Wash-up	Kitchen
Kitchen Dry Store	Kitchen Dry Store	Combined Larder and Store with Refrigerator
Kitchen Cold Storage	Kitchen Cold Storage	Combined Larder and Store with Refrigerator
Larder Hors d'œuvres Salads	Larder	Combined Larder and Store with Refrigerator
Vegetable Preparation Kitchen Vegetable Store	Vegetable Preparation and Store	Preparation
Fish Preparation Butcher's Shop	General Preparation	Preparation
Main Cold Storage:—		
Meat Deep Freeze General Milk	Main Cold Storage	*
Main Provision Store Main Fruit and Vegetable Store Bread Room Empties Store	Main Stores	*

NOTE: * *It is assumed in the illustration given that the main provision stores for the smallest unit in column 3 are located at a larger hospital within the Group.*

ADDITIONAL FACILITIES.

(a) For all Catering Departments.

Kitchen staff dining, changing, washing and toilet facilities.
Fly-proof refuse and swill bin area with drain and water point.

(b) As Applicable.

Catering office, Dietitian's office, Diet kitchen and store.
Senior staff changing, toilet and washing facilities.

SECTIONS WHICH MAY BE DE-CENTRALISED.

(With explanatory notes re location).

(i) WARD KITCHENS.

As "Ward Kitchens" are primarily required to fulfil the function of combined serveries and wash-ups, they should be equipped with appropriate items such as hot closets, boiling tables, toasters, double compartment sinks and drainers, storage units and refrigerators. For T.B. and infectious diseases and children's wards, sterilizing equipment may also have to be provided.

Ward kitchens should be large enough to accommodate the heated trolleys (or containers) which transport the food in bulk from the main kitchen, although there are often advantages if the final portioning and service of meals is carried out from the trolley within the ward.

Ward kitchens should be sited adjacent to the wards, yet so placed and designed that the minimum noise reaches the patients. In certain circumstances one ward kitchen can be made to serve more than one ward.

(ii) STAFF DINING-ROOMS.

These dining-rooms should be sited next to the kitchen block and linked with a centralised servery and wash-up.

(iii) STAFF SERVERIES AND WASHING-UP SECTIONS.

In large hospitals it is desirable to provide separate sections or rooms for washing-up equipment, linked with the serveries and dining-rooms, with adjoining still-rooms and pantries, the latter being required for the preparation of sandwiches, bread-buttering, etc.

Previous mention has been made of the advantages to be gained from planning staff serveries so that either a waitress or cafeteria type of service can be provided. This should not present great difficulties in new buildings or where spacious serveries exist.

When dining-rooms form an extension to the kitchen block both types of service can still be provided by screening the service counter from both the kitchen and dining-rooms by means of walls or partitions. Members of the staff could then enter the servery without having a general view of the activities within the kitchen.

This type of layout enables the full dining area to be utilised, and when any dining-room is used for a special occasion it will still retain the facilities of a well-sited cafeteria service counter.

(iv) DINING-ROOM SERVERIES AND WASHING-UP SECTIONS FOR AMBULANT PATIENTS.

The same general remarks apply as for staff with design dependent upon numbers involved, and type of patient.

As in the case of ward kitchens, special sterilization equipment may be necessary, and, where infectious and non-infectious personnel dine in close proximity, separate washing-up sections will be required for the segregation of crockery.

OTHER INFORMATION.

By applying the aforementioned principles so that the disposition of the sections within the catering department conform to a definite scheme, the first phase of planning can be completed.

The approximate areas of the various sections, having been obtained in plan form by roughly sketching in the equipment required, can now be finalised by positioning accurately to scale and in more detail all items and features which are to be included within the scheme.

The following points must be borne in mind during the preparation of the final layout drawing:—

(i) VENTILATION.

There is invariably a need for mechanical ventilation in the kitchen, as heat, steam and the products of combustion can cause discomfort and in some cases danger to the staff.

Ventilation systems are simplified if the apparatus is grouped together to reduce the number of separate hoods required. These hoods or canopies should not obstruct natural light, and this may be achieved by the use of glass panels.

Alternatively, adequate lighting should be provided for hoods constructed of sheet metal.

All stores should be sited to take advantage of natural ventilation. If this is not possible, a mechanical ventilation system should embrace these sections.

(ii) LIGHTING.

Although modern methods of electric lighting can do much to overcome any lack of natural light, all schemes should utilise natural light where possible, providing they still conform to the requirements of a balanced and efficient layout.

(iii) CLEANING.

Tiled, non-slip floors, walls faced with impervious material and radiused corners where possible greatly assist daily cleaning. Floors should be easy to wash down and include a carefully sited gulley or gullies. The number and length of these, however, should be restricted, and as most schemes will include a boiling pan or pans, a floor channel by this apparatus will serve the dual purpose of emptying the pans and draining surplus water from the floor.

Lengthy covered gullies, which are inclined to become slippery, and which can harbour much dirt and grease on the cover plates, can often prove to be more dangerous to the staff than well sited open ones. However, when through necessity gullies have to be positioned within or across the natural passage between equipment, they should always be covered.

All refuse and swill bin housings, in addition to being rendered fly-proof, should be provided with a hose point and gulley.

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