KITCHEN DESIGN FOR RESTAURANTS

The heart of every restaurant is the kitchen. Here raw ingredients are prepared for cooking (washing, peeling, chopping etc) and cooked for service. The quality of food and speed of service depend on efficiency, hence planning, kitchen design and layout must be undertaken with due care and expert advice if necessary.

Errors committed in planning and purchasing specifications are extremely costly in the end. A poorly planned kitchen results in high payroll, slow production, unhappy kitchen staff, and dissatisfied guests.

Ideally, kitchens should be planned according to the menu envisaged. This will allow proper equipment selection, spacing, determination of capacity and purchase accordingly. Today's high rents and construction costs dictate wise use of every square inch of space. Restaurateurs should be knowledgeable about both cooking and space allocation. . Consultants, if hired, should be interviewed in-depth before assignment.

The most qualified people in kitchen planning are experienced and successful chefs. They know from experience the best and most efficient equipment, layout and spacing.
The first decision involves selecting fuel.
There are several from which to choose:

Wood
Natural gas
Propane gas
Electric
Steam
Heating oil

Wood and heating oil equipment are generally not used in modern kitchens except wood-fired pizza ovens since they require frequent cleaning and consume space.

The most frequently used fuels are natural gas, electricity, steam and propane.

The choice of fuel depends on location. In large cities, natural gas and electricity are widely available, and a combination of both is wise. In some regions, steam may be available and recommended for certain pieces of equipment. There are also steam generating units ready to install. Propane is recommended where neither gas nor electricity is available i.e. wilderness camps or resorts.
Chinese chefs prefer propane for its extremely intense heat.

If electricity and gas are available, equipment should be selected accordingly. This will allow production if one or the other fuel is temporarily unavailable.

In third world countries electricity supply may be disrupted frequently, and gas pressure inadequate for commercial use.
In such regions, propane or butane cylinders are recommended.

Once the fuels choices are made, utilities should be contacted to ensure for timely hook ups with main supply lines, and further planning can resume.

Back-of-the-house space including the kitchen varies with both the menu size and type of operation.
There are no set rules or ratios for reference. However, in full-scale restaurants, five square feet per seat is a good guideline. If many convenience ingredients are used, kitchen space requirements will be less. For take out operations back-of-the-house requirements are considerably less than in standard restaurants.

The first step in kitchen planning is a flow chart, which allows to eliminate bottlenecks both for service and production.
During planning, the following criteria should be considered:

Departmentalisation, to achieve division of labour
Smooth traffic flow
Increased efficiency
Acceptable sanitary conditions

Once these are settled, the following points become important:

Lighting
Ventilation
Sprinkler system
Floor covering
Wall covering

Ideally, receiving, storage, preparation and cooking areas should be on the same floor as the restaurant. In downtowns of large cities, land costs are exorbitant, hence architects and kitchen planners build vertically to fully utilize every square inch of space. While it is true that some restaurateurs think it unnecessary to plan the kitchen with due care to detail, experienced operators are convinced that every hour spent on planning pays back handsomely.
Hospital and school kitchens require a different approach and depend very much on the menu.

Lighting

Every kitchen must be well illuminated to prevent accidents, increase efficiency, facilitate quality control and prevent waste. Fluorescent light fixtures are advisable for their efficiency and cool operating temperatures.

Ventilation

Ventilation is of great importance in any kitchen. It prevents odours from penetrating the dining area and increase the well being of cooks. This in turn improves quality and efficiency. Some operators actually air condition their kitchen with laudable results. A ventilation system consists of:

The collection device (canopy)
Vehicle to move the air (motor)

Canopies are equipped with filters, of which there are three types

Wire mesh
Baffle
Liquid
(All filters must be thoroughly cleaned at regular intervals to reduce fire hazards, as they collect grease)

The size of the canopy and motor depend on the size of the kitchen. Canopies must overhang cooking equipment on both sides by at least 8” (20 cm) in most jurisdictions.

Sprinkler systems

All kitchens and restaurants should have an appropriate sprinkler system.
There are two types:

Water releasing
Carbon dioxide mixed with fire extinguishing chemicals

Water releasing sprinkler systems are inappropriate for kitchens.

Carbon dioxide mixed with extinguishing chemicals type systems are recommended.

Floor coverings

Kitchen floors must be non-slip to prevent accidents. Tile coverings are prone to cracking and warping due to constant moisture present. If tiles are used, cover them with a non-slip coating. Continuous non-slip floor covering containing stone chips is the most suitable. It can be applied quickly and inexpensively. They are easy to clean and prevent insect infestation.

Wall coverings

Kitchen walls can be covered with tiles or durable high gloss finish paint. Tiles are initially expensive, but are durable and easy to clean. High gloss finish paint is more expensive in the long run and less sanitary.

After aforementioned decisions are made, the planner can proceed to selecting and specifying equipment:
Cooking equipment, brands, capacity requirements, and sources
Stationary equipment i.e. mixers, bank saws, food processors
Work table sizes, heights, finishes and locations
Widths of aisles for traffic between stationary equipment
Refrigeration units and freezers, types and sizes

Storage areas' size and shelving, for foodstuffs, china, cutlery and glassware
Dishwashing area equipment, location capacity
Receiving area, location, layout, size, equipment i.e scale, running water, lighting, security
Garbage disposal area, location, size, and type
(N. B. In hot countries, consider refrigeration, and in cold proper insulation and security from scavenging animals)

Kitchen equipment

Kitchen equipment can be conveniently grouped into five categories; storage-, preparation-, cooking-, accessory- and service equipment.
Restaurant planners are advised to study all equipment available, manufacturer, source, and compatibility with local standards in force.
Storage equipment consists of industrial food-grade shelving. It may be wire or solid. Wire shelving is appropriate for canned goods or boxes, solid shelving is required in refrigerators and freezers. They are easy to clean. All shelving must be arranged appropriately to facilitate adequate air circulation.
There are upright, chest, and walk-in freezers. Chest freezers preserve cold air but utilize more floor space, whereas upright freezes use less floor space but allow cold air to escape rapidly each time the door is opened. Walk-in freezers are recommended for operations using considerable amounts of frozen foods. Freezers can be purchased pre-fabricated, modular, or be custom -made. In every walk-in installation, care should be taken to position the freezer to open into a refrigerator in order to preserve at least part of the cold air, which inevitably escapes each time the door is opened. (Cold air costs three times as much as warm air)
There are standard- or blast freezers for quick freezing of vegetables or plated food. Cryogenic freezers use liquid nitrogen or carbon dioxide and freeze fast.
They are recommended for hospitals and institutions feeding large numbers of people at set times

REFRIGERATORS
Refrigerators prevent bacterial growth and prolong the shelf life of perishable foods. There are electricity or gas fuelled, reach-in, roll-in, drawer and walk-in refrigerators. Electricity powered refrigerators are the most common.
Reach-in and walk-in refrigerators are readily available in a variety of sizes and configurations. Walk-in refrigerators can be specified modular or custom made. Drawer and roll-in refrigerators are practical and save

labour but must be custom manufactured and expensive.
All commercial refrigerators must be equipped with thermostats both inside and out. Interiors of all must be easy to reach, clean, and well lit. Walk-in refrigerators must have non-slip floors and equipped to open from inside and outside. All doors must be airtight and equipped with self-closing mechanisms to minimize cold air loss.
A well-designed compressor maintenance programme will help prolong usable life. Wooden storage shelving is not recommended. Tempering refrigerators to re-thermalize plated frozen food is practical in hospital and correctional institutions.

PREPARATION EQUIPMENT - constitute all equipment employed in food preparation (chopping, dicing, cubing, peeling, slicing, mixing, processing). They speed up all these functions, reduce labour, facilitate quality control and promote consistency.
Specify sturdy brands, backed up by a good supply of spare parts, warranties, guarantees and service. Foreign suppliers should be specified only if local manufacturers are inadequate or do not exist.

COOKING EQUIPMENT. All equipment used in cooking fall under this category, and may be fuelled by electricity, propane, natural gas, oil, wood, or steam .
The fuel must be selected with due care according to availability and style of cooking being envisaged.
Steam generators are available, so are cooking equipment with self steam generating installations.
Always specify cooking equipment with the least number of moving parts.

THE FOLLOWING COOKING EQUIPMENT IS STANDARD:

Ranges: -hot top
- open burners
Deep fryers: electric or gas
Broilers: ceramic brickets
radiant
infra red
open
Salamanders: (top heat)
electric
infrared
gas

STEAM FUELLED EQUIPMENT
Steam jacketed kettles- Floor, counter top, tilting or non-tilting, with or without spout in various sizes are available.
Pressure steamers are suitable for quantity batch cooking. Combi-ovens combine steaming and roasting, and are popular due to their space saving features.

OVENS – a wide range of ovens is available. They can be under ranges, freestanding, electric or gas, steam injected or not. Convection ovens are practical for roasting and rotate hot air speeding up cooking time. Conveyor type ovens are appropriate in high volume pizza operations or in very busy bakeries. Micro wave ovens are used mostly for re-thermalizing.

GRIDDLES – consist of a stainless steel non-stick surface fuelled either by gas or electricity, equipped with appropriate grooves and grease collectors. They are versatile and very much in demand in short order kitchens and cafeterias.

TILTING FRYING PANS- may be gas or electric fuelled. They are practical in large banquet halls or hotel banquet kitchens catering to huge banquets. Cooking equipment is rated either in units per hour or BTU's

(British Thermal Unit) One British Thermal Unit is the amount of energy required to raise the temperature of one pound of water by one degree Fahrenheit. The rating is important to calculate power requirements.

ACCESSORIES – Electronic thermostats, energy load levellers (reduce peak electricity demand) and automatic shut off switches fall under this category. Service equipment – helps keep prepared foods hot. Steam tables, flambé carts, gueridons, coffee machines, small wares (pots, pans, whips, scoops) self levelling plate dispensers, dishwashers, compactors, filtering devices fall into this category.

Once the equipment selection is completed, and the layout determined, the planner must contact utilities and advise them to ensure timely hook up to main supply lines.
Floor space dedicated to kettles must be furnished with splashguards and drainage.

There is a wide range of manufacturers of kitchen equipment and the planner must carefully specify before making purchase decisions. Equipment is sold by dealers, distributors, jobbers, manufacturer's agents, or directly by the manufacturer pending on the size of the order or the size.
In most cases local or regional restaurant and hotel supply companies are best equipped to serve.

Dealers quote F O B (Free On Board) prices and do not include installation. Both transportation and installation have to be arranged by the purchaser or may be arranged by the dealer for an additional charge.
If cooking or service equipment is purchased abroad, it is important to check specification and standards to ensure that they comply with local rules and regulations
Equipment selection and purchasing require due attention to detail, cost and quality.
Planners must be knowledgeable, spend time and effort to ensure that all equipment arrives in good order, and is installed to be approved by appropriate government departments and comply with all rules and regulations.

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