

Module 3

Kitchen & Restaurant Design

Basis Kitchen Design Principles

Understanding the basic principles of kitchen layout will help take much of the mystery out of the design process. The most basic layout principle is the **work triangle**. The work triangle is the line drawn from each of the three primary workstations in the kitchen – **the food storage area, the cooking area, and the clean-up area**. By drawing a line between each of these areas in your plan, you can see the distance you'll walk to move to and from each area.

The sum of the ideal work triangle is supposed to be between 15 and 22 feet, putting each of the three appliances within two or three steps of one another. The three primary kitchen workstations that create the work triangle are:

1. **Food storage** – Your refrigerator and pantry are the major items here. Cabinetry, like lazy susan or swing-out pantry units, add function and convenience. Options like wine racks, spice racks, and rollout trays help to organize your groceries.
2. **The preparation/cooking station** – Your range, oven, microwave, and smaller appliances are found in this area. Counter space is important in this section. Conserve space by moving appliances off the counter with appliance garage cabinets and space-saving ideas like towel rods and pot lid racks.
3. **The clean-up station** – Everyone's least favorite activity is one of the kitchen's most important – clean up. This area is home to the sink, waste disposal, and dishwasher. Cabinetry for this station is designed to organize with the trash bin cabinet and rollout tray baskets for storage convenience.

Your kitchen is probably more than just a place to cook and eat. You may choose to include a breakfast bar, desk, bookshelves, a computer station, a TV or whatever in your kitchen.

Triangle reloaded

The work triangle, however, is experiencing a remodel of its own. The work triangle was designed for an age when there was only one cook, and only three appliances (fridge, stove, sink).

Here are a few top tips:

- No leg of the triangle is supposed to be less than 4 feet or more than 9 feet
- There should be no human traffic flow cutting through the triangle.
- Place the microwave near the refrigerator for convenience

Space Considerations:

- **Walk space should be 42- 48 inches wide** to account for traffic flow and clearance of large appliance doors or large relatives
- Counter space on either side of the range or cooktop **should be a minimum of 15 inches, but this will not be adequate in most kitchens.**
- **An 18-inch counter should be adjacent to the fridge** on the same side as the handle-**again in most kitchens is not adequate.**
- **The food prep area (minimum counter space 36 inches)** is ideally located between the fridge and the sink; if the food prep area is between the sink and the range or cooktop, it will involve more travel.
- A lower surface is best for food prep (measure 7 to 8 inches below your elbow height)
- In two-cook kitchens, the fridge and range/cooktop are usually shared. Some may have more than one cooking area.
- Two triangles can share a leg, but shouldn't overlap
- An island with a second sink creates at least one more triangle and adapts to many uses: wet bar location, flower cutting, and arranging, homework station, etc.

Area Required For various Kitchen

Many elements make calculating kitchen areas controversial and even experts differ. Kitchen areas vary according to the type and number of meals provided. At the same time, information about the number alone is not sufficient to plan a kitchen or to calculate its area. Knowledge of peak load is essential and this must be either based on experience, or intelligent forecasting, in case of a new establishment. Under certain circumstances, hotel and restaurant kitchens have been as much as 40% of the total restaurant area.

There are no hard and fast rules for calculating kitchen areas or space. However, as a suggestion ‘rule of thumb’ is 0.56 sq. m or 06 sq. ft of floor area per person should be accommodated in the dining room at the planning stage. This figure is arrived at by assuming that 50 percent of the area allowed in assessing the size of the dining room is 1.10sq.m (or 12sq.ft.) per person, which includes tables, passageways, etc. For example, if the floor area of the restaurant is 2000 sq.ft. then the kitchen space should be approximately 1000 sq.ft.

However, no firm rules as to area can thus be given, while a rough idea about the kitchen space normally required can be had from the following tables 1, 2 and 3. Those are for broad guidance only.

Table 1: Approximate indication of kitchen requirements

No. of Eating Members during Business Hours	Kitchen Area Desirable per Person (in sq.ft.)
100	5 – 9
100 – 250	4 – 6
250 – 500	4 – 5
500 – 1000	3 – 4
Over 1000	2.5 – 3

Note: Area reduction may be made when convenience foods (frozen) are fully exploited. The lower figures relate to such simpler operations while the higher for complete catering.

Table 2 : Possible Area (in sq. ft) on a Daily Basis of Catering Capacity

Total Meals per Day	Restaurant Area	Kitchen Area	Total Catering Floor Space
100	375	150	525
250	560	215	775
500	950	300	1250
1000	1500	500	2000

Table 3 : Possible Area (in sq.ft.) on a Daily Basis of Seating Capacity

Seating Capacity	Restaurant Area	Kitchen Area	Estimated Possible No. Of Meals Per Hour
50	700	300	75
75	1000	400	115
100	1250	500	150
125	1750	750	190
200	2750	1200	300

Out of a hotel kitchen area anything between 15 and 25 per cent may be required for storage depending upon the nature of operations and its form of supplies. The remaining space can be devoted to food preparation, cooking and serving. In case of catering area, initial planning is not the concern of a single person, but involves a project team or committee which includes the Chefs, hotelier and restaurateur. Their views have to be reconciled with site limitations and other members of the team such as consultants, kitchen engineer, all of whose activities are coordinated by the architect.

Factors that affect kitchen design

The factors which can affect the layout plan are:-

1. Type of business
2. Type of customers
3. Possibility of expansions
4. Seasonal pressures
5. Number of covers (guests) to be offered
6. Cover turnover
7. Type of meal
8. Timings of meals (lunch or dinner service, or day service)
9. Facilities of equipment in a still room
10. Floor space
11. To what extent will 'convenience' foods be used?
12. Is an allowance to be made for special functions?
13. Type of service proposed- self- service, cafeteria, waiter or waitress service)
14. Position of windows, ventilation, drainage, water service, etc.

Here are the notable **characteristics of good commercial kitchen design**, that you need to consider in your kitchen planning and layout.

➤ **Energy Efficiency**

Commercial kitchen design has a direct impact on your energy costs. One sure way to keep energy consumption to a minimum is to locate all the cooking ranges in one place so as to optimize the energy costs associated with with exhaust hoods.

➤ **Ergonomic**

The best kitchen design is such that the staff movements are kept to a bare minimum. This can only be achieved through the incorporation of ergonomic design. Ergonomic design helps your commercial kitchen reduce or eliminate accidents and accidental food spillages, and also, save time in food preparation.

➤ **Ventilation**

Proper ventilation is very important in the design of every commercial kitchen. Every hotel or restaurant kitchen planner knows that proper ventilation is essential for safety and the comfort of the hotel staff. It also saves your diners from having to be surrounded by food smells.

➤ **Maintenance**

The best industrial kitchen design makes for easy maintenance by using the right materials and optimizing equipment arrangement and storage.

➤ **Size**

Another element of good commercial kitchen design is that there should be a connection between the size of the kitchen and that of the restaurant. The basic rule of thumb is that there should be 5 square feet of space for every chair that is in the restaurant.

➤ **Team**

You can never design the best commercial kitchen without first putting together the best team with which to work. You need to have professional and experienced contractors such as plumbers and electricians as well as experienced chefs in your team. It also helps to have knowledge of the food that the business will serve as it has a bearing on the layout and equipment choices.

The layout of Commercial Kitchen

A successful commercial kitchen layout is easy to use, meets the restaurant's needs, and enables your service staff to deliver an amazing restaurant experience. Whether you're building a restaurant from scratch, or have (literally) hit a wall with your current design and need to renovate.

5 Types of commercial kitchen layouts

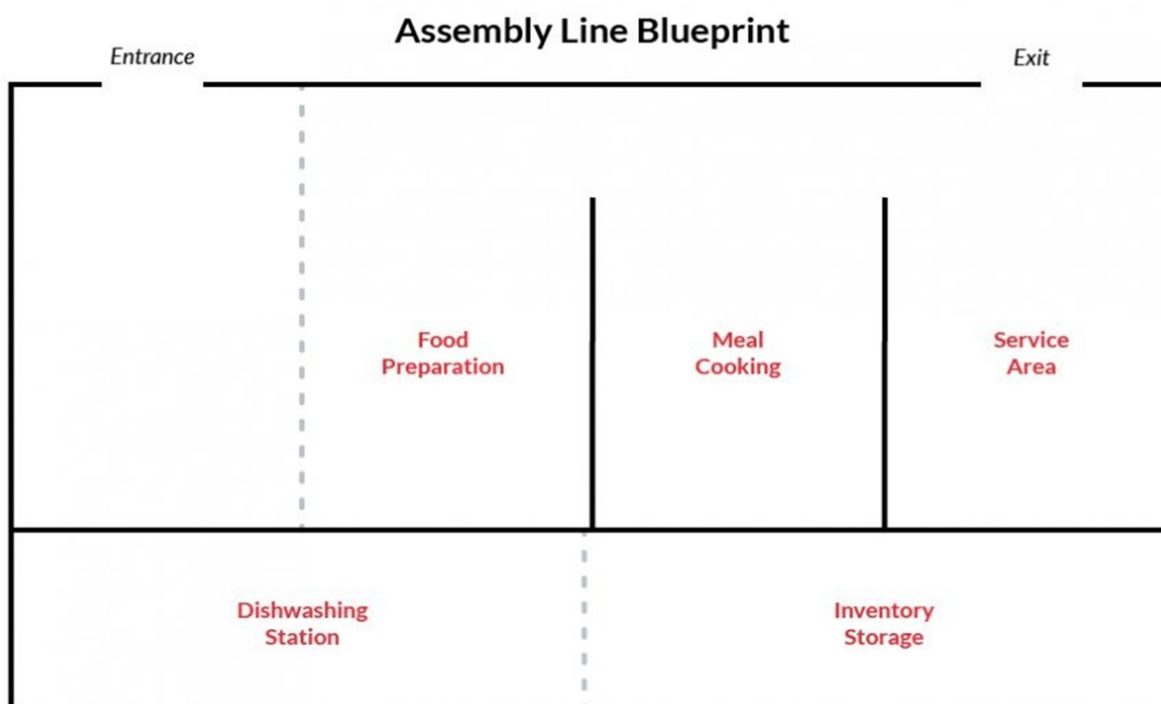
Now that you understand the components of a functional commercial kitchen, and have thought about elements such as safety and ergonomics, it's time to start designing your restaurant's kitchen. Take inspiration from these five popular commercial kitchen layouts.

Commercial kitchen layout types

1. Assembly line layout
2. Island layout
3. Zone-style layout
4. Galley layout
5. Open kitchen layout

1. Assembly line layout

The assembly line configuration consists of a central row or island that starts with food prep and ends with a completed item that is ready to be taken to be served.



The benefits of the assembly line layout

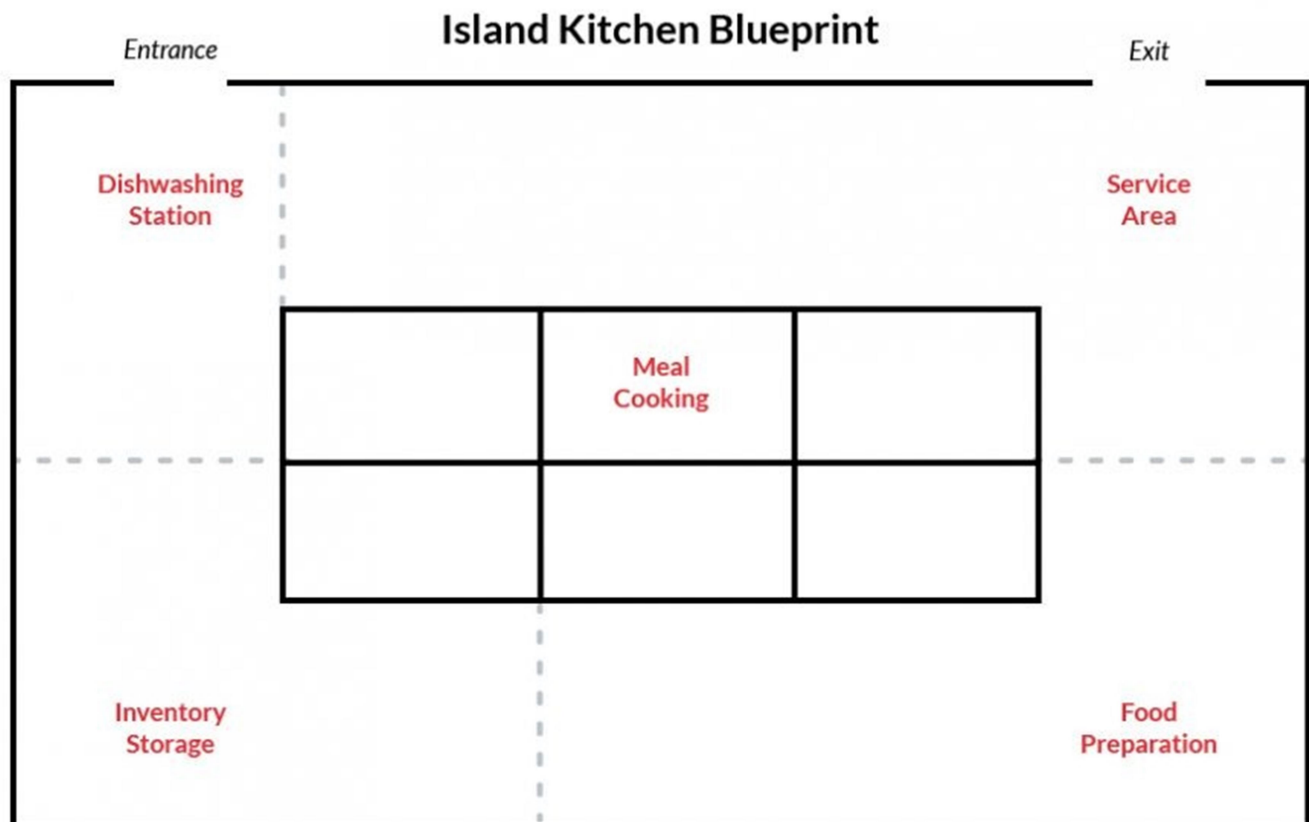
This commercial kitchen layout facilitates the production of lots of the same type of dish over and over again. The assembly line works best with multiple cooks who are each responsible for one part of the food production process.

Which restaurant-types is the assembly line layout best for?

The assembly line layout is best for fast food restaurants or restaurants with limited menus that have similar preparation styles, like pizza parlors or build-your-own bowl restaurants.

2. Island layout

The island commercial kitchen layout starts with the ring layout and adds a central preparation or cooking station. For example, a kitchen may have storage units, washing stations, and food prep counters along its perimeter, and cooking equipment in its center.



The benefits of the island kitchen layout

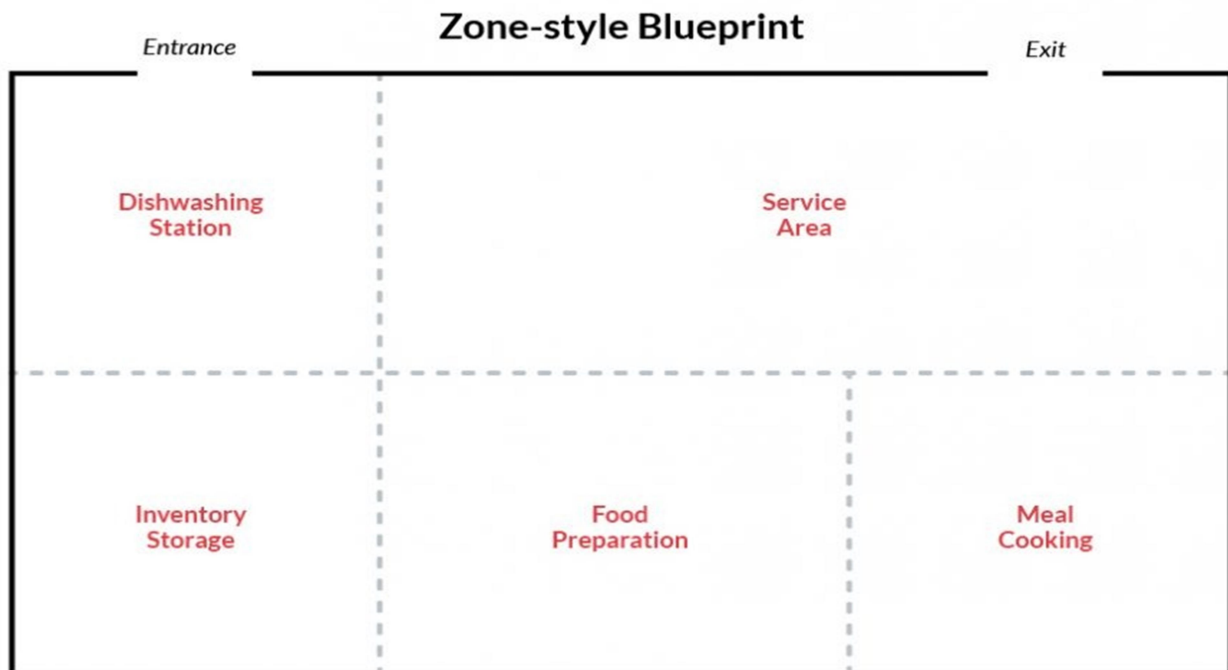
With a central “command center” or passthrough point for all meals, the island configuration facilitates staff communication and executive chef supervision.

Which restaurant-types is the island kitchen layout best for?

The island setup is best for restaurants with ample kitchen space to ensure that the island doesn't create an obstacle for the BOH team.

3. Zone-style layout

The station layout creates separate zones for each type of activity that goes on in the kitchen or for each kind of dish that is prepared in it. For example, a restaurant could have a soup and salad station, meat station, frying station, and baking station.



The benefits of the zone-style layout

The station commercial kitchen layout keeps the kitchen organized and allows different types of dishes to be prepared at the same time. This layout helps BOH staff divide and conquer. You can hire a specialized chef for each station rather than a line cook to create everything from start to finish.

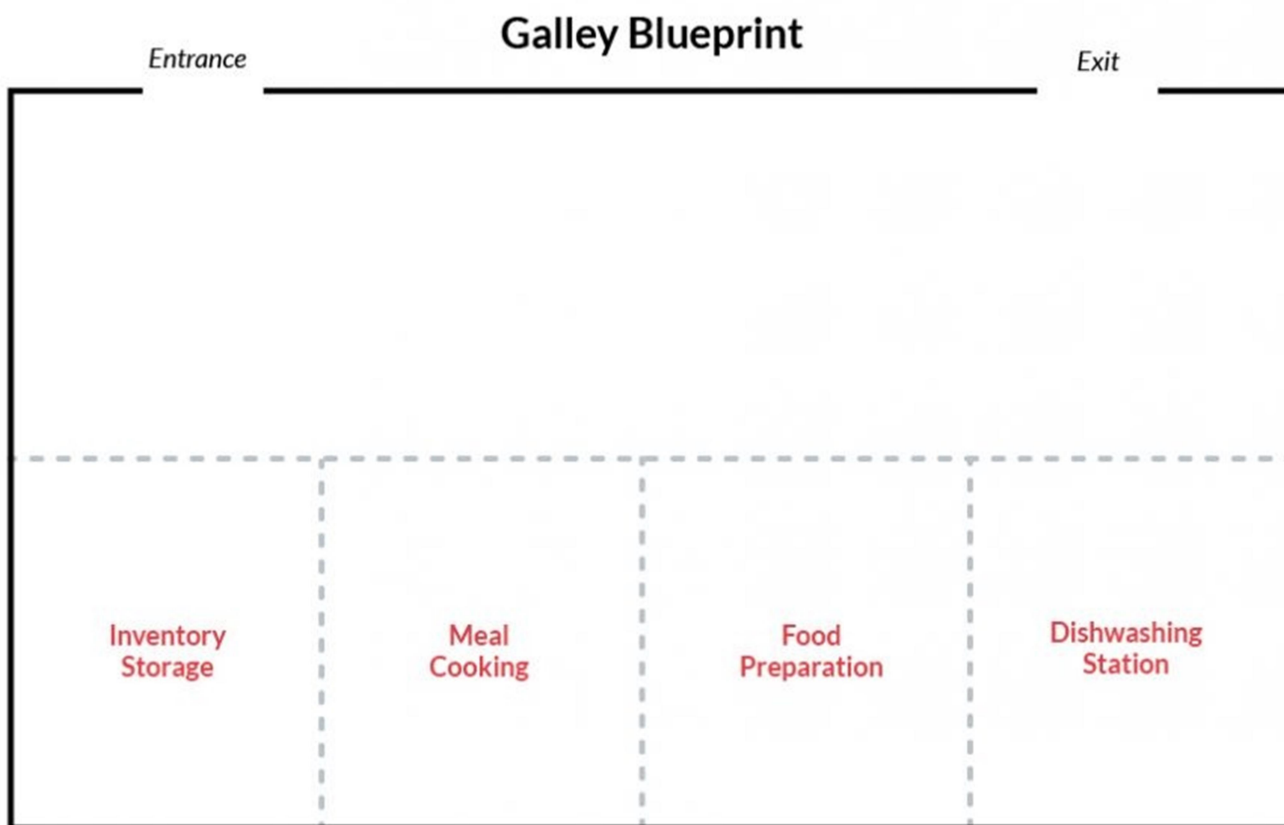
Which restaurant-types is the zone-style kitchen layout best for?

This layout is best for restaurants with diverse menus and lots of staff. The station layout is suited for large operations like hotel restaurants, catering kitchens, or event space kitchens.

Restaurants with small kitchens should avoid the station-based configuration as it doesn't allow for multitasking. You'll need ample space and staff to make this type of kitchen function smoothly.

4. Galley layout

In this commercial kitchen layout, all stations and equipment are on the perimeter of the kitchen. In a very tight space, kitchen equipment is placed along only parallel two walls.



The benefits of the galley layout

If your kitchen is large enough to have a ring layout with empty space in the center, you can have multiple cooks in the kitchen and they can easily rotate to work multiple stations at once. In a very small space, like a food truck, the galley kitchen is the only option space allows.

Which restaurant-types is the galley kitchen layout best for?

The ring and galley configurations are best for tight spaces with some staff, such as food trucks.

5. Open kitchen layout

An open kitchen layout lets customers see the action that usually takes place behind the scenes. Any commercial kitchen layout can be turned into an open kitchen by taking down a wall.

To ensure guest safety, it's best to keep hot cooking appliances as far away from customers as possible. A glass partition between the service area and guest seating is a smart choice to protect the food from unexpected sneezes or coughs.



The benefits of the open kitchen layout

The open kitchen is great for entertaining guests. An open kitchen is also a good opportunity to maximize a small space. You can create a chef's table seating by placing bar stools in the kitchen.

Which restaurant-types is the open kitchen layout best for?

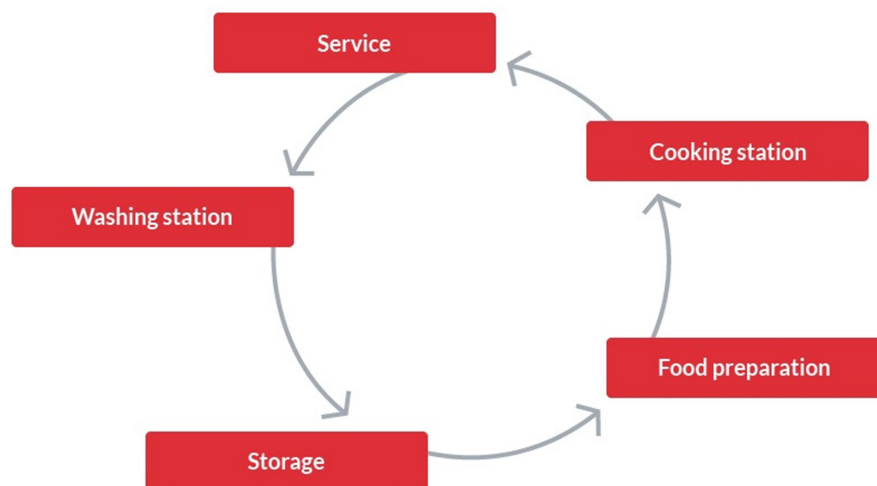
Open layout kitchens are typically seen at high-end restaurants or restaurants with small commercial spaces. Watching the cooks prepare dishes becomes an integral part of the dining experience.

The 5 key components of a commercial kitchen

Before designing a commercial kitchen space, it's important to account for the needs that the kitchen must fulfill and the equipment associated with those needs. When you know what components need to fit into space from the beginning of the design process, you will be able to design your commercial kitchen layout more effectively.

The 5 components of a commercial kitchen

1. Storage
2. washing station
3. Food preparation
4. Cooking station
5. Service area



1. Storage

Your restaurant's kitchen will store a variety of items including cooking tools (utensils, pans, etc.), food (produce, meats, dry goods), and place settings (glasses, plates, linens).

Your kitchen will need separate storage units for each of these needs, such as a refrigerator for perishable foods, a pantry for dry goods, and cupboards for place settings and tools.

2. Washing station

A lot of cleaning goes on in a commercial kitchen to ensure the safety of the food that's being served and the dishes that it's being served on. We recommend creating separate washing stations for food and for dishes so that dirty dish suds never land on clean produce! Your washing stations will need commercial dishwashing machines, sinks, and drying racks to run smoothly.

3. Food preparation

A commercial kitchen may have several food preparation areas depending on what kind of food is on the menu. The food prep section of a restaurant's kitchen consists of counter space, cutting tools, and storage containers.

Place food preparation zones near a refrigerator so that your BOH team can quickly and safely store raw ingredients until they're ready to be used.

4. Cooking station

Unless your restaurant's concept is raw foods, your kitchen will need quite a bit of cooking equipment to execute your menu. Most restaurants have gas range-oven combinations and commercial fryers, and some specialized cooking appliances. A kitchen display system makes it easy for BOH staff to keep up with incoming tickets.

5. Service

A commercial kitchen's service area is used for plating dishes and handing them off to servers to deliver to diners. A service area should have heat lamps to keep food warm. Place your kitchen's service area as close to the dining room as possible to lessen the distance from the kitchen to the table for waiters.

The most important commercial kitchen layout considerations

Now that you understand the key components of a commercial kitchen, you must also factor a few crucial considerations into your kitchen's design in order to ensure that it's safe and functional.

1. Ergonomics

Ergonomics is the science behind "designing and arranging things people use so that the people and things interact most efficiently and safely."

In order to create a functional, user-friendly commercial kitchen layout you must take into consideration how much equipment the kitchen will need to hold, how many people will be in the kitchen and the flow of the staff's routes between stations.

2. Space

How much room you have to work with will limit which commercial kitchen layouts you can adopt. Industry guidelines recommend dedicating 60% of your commercial space to the front of the house and reserving the remaining 40% for your back of the house.

So if your restaurant has an area of 500 square feet, 300 square feet would be used for the dining area and waiting room, and the remaining 200 square feet would be used for the kitchen.

3. Staff communication

Don't forget about the human elements of designing a space. Facilitate staff interaction and communication with an open floor plan instead of a maze-like kitchen with walled-off sections. Make it easy for executive chefs and managers to oversee what's going on in the kitchen so that they can train and communicate with staff.

This consideration may be more important in a fast-food environment with the inexperienced staff than at a high-end restaurant with experienced chefs.

4. Safety

Safety and design go hand in hand. First, you need to consider food safety in your restaurant. Design a space that keeps food safe for consumption. A few simple ways to do this include placing your receiving near the fridge and avoiding cleaning chemicals near food.

You'll also need to check local regulations to ensure that your restaurant takes food safety precautions that go beyond common sense. In some states, local regulations may determine your commercial kitchen's layout or design elements.

For example, Missouri's food code prohibits the use of wood as a food preparation surface (with a few exceptions) and prohibits carpeting in a commercial kitchen. Check local commercial kitchen laws to ensure that your restaurant is up to code.

You should also take your staff's health into consideration as you design your commercial kitchen. Build proper ventilation into space. Placemats on the ground to reduce knee and back wear-and-tear from standing.

Fire safety is another major element you must take into consideration while designing a safe restaurant kitchen. Create fire exits. Install smoke detectors and fire extinguishers. Work with your interior designer to make room for everyday kitchen equipment into your space *and* emergency tools.

Choosing the right commercial kitchen layout for your restaurant

The strategic design makes a kitchen functional and safe. The right commercial kitchen layout enables a BOH team to do their best work safely and efficiently, resulting in lower staff turnover and higher customer satisfaction. However, there is no one kitchen layout that's better than the rest.

Following these steps when evaluating a commercial space's ideal kitchen layout:

1. Create a process to execute each menu item
2. Develop an equipment list for each kitchen station based on menu requirements
3. Organize or design the equipment layout for each station
4. Arrange the stations next to each other that share menu components
5. Determine your service process to complete dishes for delivery to the customer
6. Design your expediting station and place it at the center point of all culinary stations
7. Understand your building limitations and be willing to find alternate execution and service delivery methods to accommodate
8. Visualize a dry run, executing each menu item in your new kitchen to ensure they are created and delivered efficiently

Importance of Restaurant Design

This is one of the most important support departments of the F&B department. Kitchen stewarding contributes to the successful operation of the Food production and service department.

It performs the following functions:

1. Washing kitchen pots and pans (scullery/pot wash).
2. Maintaining kitchen equipment.
3. Cleaning all kitchen equipment and ensuring hygiene.

4. Garbage disposal.
5. Washing all service equipment including the ones used in banquets.
6. Polishing silverware• Sending damaged silverware for plating.
7. Pest control• Carrying transporting heavy articles.
8. Indenting for new crockery cutlery.
9. Gas connections and upkeep of tandoor.
10. Maintaining ppm levels for sanitizing knives and chopping boards.
11. Replenishment of serviceware to various outlets.