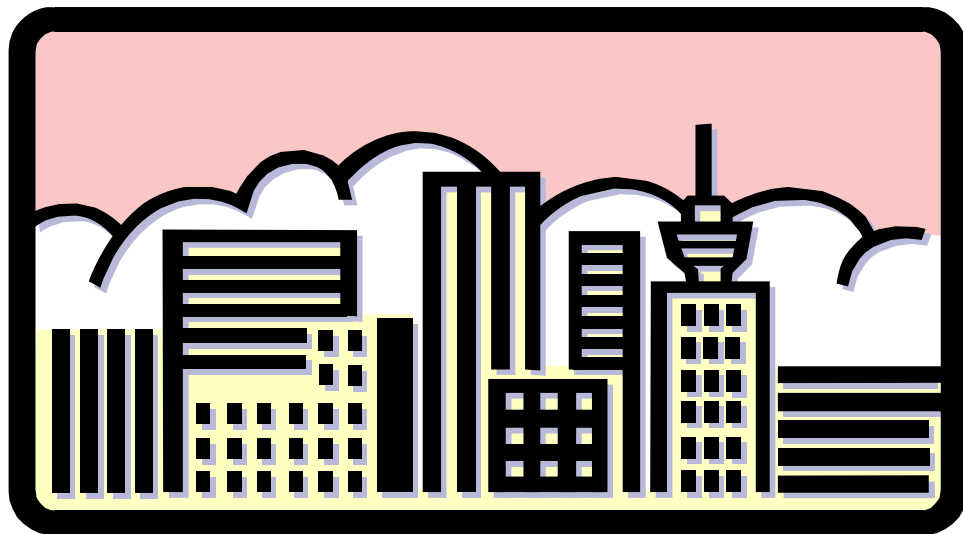


GUIDELINES FOR PLANNING AND BUDGETING FOODSERVICE OPERATIONS



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GUIDELINES FOR PLANNING AND BUDGETING FOODSERVICE OPERATIONS

INTRODUCTION

Dear Fellow Professional-

We are often asked to provide consulting on facilities that could have been more successful if the space or budget had been developed with the input of someone with knowledge of foodservice planning and program requirements. We prepared this document, in the interest of providing important criteria to those who need it during the early planning or feasibility phases of a project. The information was assembled from a collection of material taken from dozens of publications, articles, clippings, and manufacturer's guidelines. We have collected and used this information in our office over 30 years.

The guidelines are intended to provide an architect or engineer with as much useful information as possible to start the planning and programming process, and then add a qualified foodservice design professional to their team when the time is appropriate. We hope that you will consider our firm to provide those services. This booklet should serve as a small indication of our firm's commitment to the success of every project and our overall concern with the quality of design on all foodservice operations.

Foster F. Frable, Jr.
President

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Overview on Dining Area Calculations

Determining the right size for a dining area starts with estimating the total number of patrons during the busiest meal period. In on-site cafeterias the total building population never translates directly into the dining room size. Participation varies from 40-80% depending on location, outside options available, and the type of population. For example buildings within downtown areas or with large traveling populations will have lower participation, then say, call centers, or college union buildings in rural sites. Typically, the patrons dine in 2 or 3 meal periods, which further divides the number of patrons. Take-out is also a major factor; in some operations 50% or more of the population will take food back to their workspace, dorm or classroom. Once the total number of "dine-in" patrons per meal period have been determined the number of seats is based on:

- a) Industry Standards and Requirements for Wheel Chair Access
- b) The anticipated vacancy rate
- c) Turnover rates for specific operations

DINING/BAR SEATING

Turnover Rates (Per Hour)

Total Meals Served/Turnover = Seats Required

Cafeteria 2-3

Counter/Fast Service 2-3 ½

Café/Family Dining 1-2 ½

Fine Dining ½-1

Cafeteria lines
typically move at 4-
8 Patrons/Minute

Vacancy Rate

Assume 15-20% Empty Seat Factor on All Seating (i.e. Total number to be Seated x 1.15 or 1.2 = Number of Seats Required).

Banquet Dining

14-16 Sq. Ft./Seat

Provide 10-15% of
Function Space in
Separate
Table/Chair Storage

Cocktail Lounge

12-14 Sq. Ft. / Seat

20 S.F. Per Stool (including space for bar top)

Counter/Fast Service Seating

10-14 Sq. Ft./Seat

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Prison/Jail Dining

18 Sq. Ft./Seat

Cafeterias:**Office / Research** 15-18 Sq. Ft./Seat**Industrial / In-Plant** 131-15 Sq. Ft./Seat**School Cafeterias** 10-14 Sq. Ft./Seat**Restaurant Dining Rooms****Café/Bistro** 17-20 Sq. Ft./Seat**Hotel/Club/Fine Dining** 22-24 Sq. Ft./Seat**Wheelchair Dining**

20-24 Sq. Ft./Seat

BAR DETAILS**Bar Height**

A typical bar top is 42-44" in height

Backbar Equipment

36-42" High – Typically available in 2-foot long intervals; 2, 4, 6, 8ft ext.

Bar Top Width

24" Wide including drink rail

Underbar Equipment

22-26" Deep

Bar Length

20-22" per Standing Person, 24" per Bar Stool

Bar Stool Height

28-30"

Provide as many curves or corners as possible to encourage interaction between bar patrons

Island style bars accommodate more customers and offer better interactions & sight between patrons, but they are more difficult to design and coordinate so that they don't show mechanical connections and gaps and openings between equipment.

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DINING DETAILS

Chair Seat Height

17-18" (Dining)

Table Top Height

29-30" (Dining)

Counter Seating

Stool Spacing at Counter - 24-26" on Center

Stool Seating Counter Height 36".

Service Stands

1 Small Dry Stand Per 20 Diners (6-10 Sq. Ft.)

1 Large Wet Stand Per 60 Diners (20-40 Sq. Ft.)

Space between Tables in Dining Areas

(Including Chair Space) 48-60"

Traffic Path between Occupied Chairs in Dining Areas

18" Minimum, 24" Recommended

Dining Room/Kitchen Door Size

36" Minimal, 42" Recommended

Providing a 42" door allows a server to walk thru the door opening with a standard oval tray extended over their shoulder.

CAFETERIA DETAILS

Cafeteria Trayslide

11-13" Wide x 34" High

(Adding a traylock above slide allows an 8-10" wide trayslide.)

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BUDGET GUIDELINES

For combined front and back of house areas, assume the year 2009 as a base
(add 15-30% for downtown areas and renovations)

	<u>Total Area/Seat</u>	<u>Total Facility Cost</u>
Fast Service	18-24	\$175-225/Sq. Ft.
Cafeteria/Servery	22-30	\$200-275/Sq. Ft.
Café/Bistro	20-28	\$175-250/Sq. Ft.
Fine Dining/Hotel	24-32	\$250-350/Sq. Ft.

Budgets do **not**
include base
building shell.

Average Budget Breakdowns as a percentage of total project cost
(assumes new construction)

Kitchen/Equipment & Installation	35-45%
Mechanical/Electrical/Plumbing/Ventilation	30-45%
General Construction/Permits, Fees	25-35%.

Institutional/Hotel/Hospital Kitchen Equipment Cost Only \$150-175/Sq. Ft.

KITCHEN & SERVICE AREA PROGRAMMING

Employee Cafeterias

13-15 Sq. Ft./Dining Room Seat
(35% Servery/65% Kitchen-Storeroom-Dishwashing)

The greatest
demand on
hotel dining is
at breakfast.

Hotel Kitchens & Dining

13-15 Sq. Ft. per Restaurant Seat and 2.5 Sq. Ft./Banquet Seat
Total # of Seats in Hotel Restaurants = .60-75 x Number of Guest Rooms
of Seats in 3-Meal Restaurant = .45-50 x Number of Guest Rooms

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Hospital Kitchens

Without Cafeteria/Servery 18-20 Sq. Ft./Bed
 With Cafeteria/Servery 24-30 Sq. Ft./Bed
 Tray Conveyor Assembly Areas In Healthcare Facilities

<u>Facility Size</u>	<u>Conveyor Length/Type</u>	<u>Minimum Area Requirements*</u>
10-30 Beds-	Trays are usually assembled on tables or counters	
30-100 Beds-	12-14 Feet (manual roller)	16 x 22 Ft.=350SF/400SF
100-225 Beds-	18-20 Feet (manual or powered)	18 x 32 Ft.=576SF/700SF
225-375 Beds-	24-28 Feet (powered belt)	20 x 34 Ft.=680SF/820SF
400-500 Beds-	28-30 Feet (powered belt)	20x36 Ft.=720SF/875SF
500-600 Beds-	32-34 Feet (double belt)	20 x 44Ft=880SF/1050SF

For facilities with hot trays for over 550-600 Beds, two tray lines are typically recommended to allow the meals to be assembled in less than 2 hours. Cold food tray assembly can operate continuously so production can be spread out over an 8-hour shift.

Tray lines can be straight, U shaped, or circular depending on space and the need to fit around columns and obstructions.

*The minimum area dimensions and area for the tray assembly line assume a 24" aisle around the equipment. The larger number includes 20% for circulation and support functions.

Targeted Productivity of Tray Assembly Lines-

Acute care 3-4.5 trays per minute (hot line) 4-6 trays per minute (cold line)
 Long-term care- 5-8 trays per minute
 Corrections Facilities- 10-18 trays per minute

Jail/Prison Kitchens

12-14 Sq. Ft. per Prisoner

Table Service Restaurant Kitchens

9-12 Sq. Ft. per Seat

School Kitchens

12 Sq. Ft. per Seat (35% of space is Servery / 65% Kitchen-Storeroom-Dishwashing).

Typical tray productivity
 Acute care 3-4.5 trays per minute (hot line) 4-6 trays per minute (cold line)
 Long-term care- 5-8 trays per minute
 Corrections Facilities- 10-18 trays per

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Kitchen Work Aisles	1 Person Working 36" Aisle.
	1 Person Passing 1 Worker 42" Aisle.
	2 Persons Working Back-to-Back 42-44" Aisle.
	1 Person Passing 2 Workers Back to Back 48" Aisle.
	Cart/Truck Passing 2 Workers Back to Back 60" Aisle.

Specific Kitchen Areas (Average gross Sq. Ft./Dining Room Seat or Bed)

Areas	Cafeteria	Table Service Restaurant	Healthcare
Dry / Receiving	1.0	1.2	2.0
Refrigeration (coolers & freezer)	1.0	1.3	2.5
Production (hot and cold prep)	4.4	5.5	6.5
Ware Washing & Sanitation	2.0	1.3	3.0
Servery	5.0	NA	5.0
D.R. Service	NA	1.0	NA
Tray Line	NA	NA	3.0
Employee Areas (lockers, break room, toilet)	1.0	.8	1.2
Office(s)	.6	.4	1.0
Total Average	15.0	11.5	24.2

* In facilities using disposables, same area is required for tray drop, trash handling, and increased paper supply storage.

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SANITATION AND SUPPORT AREAS

Mop Sink and Supply Storage- Most health department regulations required a separate mop or janitors sink, usually in a dedicated area (niche or closet) with reasonable accessibility to all foodservice work areas. A typical sink is 24" x 24" or 10 S.F. of space is usually adequate for the sink and mop bucket storage. In addition, secure and separate storage needs to be provided for cleaning and insect/vermin control products.

Toilet Guidelines for Foodservice Employees

10-24 Employees - 2	25-49 Employees - 3
50-74 Employees - 4	75-100 Employees – 5

Staff Lockers- Many codes now require lockers and changing areas for all kitchen staff except managers and office workers. Often these can be combined with toilet rooms. Common solutions include combo box lockers and hanging rails for coats. A 72" x 72" x 18" deep unit provides coat and locker space for 16 employees.

LIGHTING REQUIREMENTS

(Watts (Food Candles)/Sq. Ft.)

Fast Service	6-7 Watts (40-50 F.C.)
Fine Dining	2-3 Watts (15-20 F.C.)
Kitchens	4-5 Watts (30-40 F.C.)
Storerooms	4 Watts (20 F.C.)

Always verify light levels with local health department requirements.

Servery/Display Kitchens – use incandescent/Halogen Never Fluorescent.
Distance between Dining Table and Overhead Light – 28-30"

UTILITY REQUIREMENTS/Sq. Ft.

Assumes Full Service Kitchen

Air Supply for Air Cooled Refrigerators

500 CFM per Compressor HP for each appliance

Steam

(used for Kettles, Cookers, Coffee Urns, Dishwashers) .25 Lb/Hr/Sq. Ft.
34.5 Lb = 1 BHP (Builder, Horsepower)
Recommended steam pressure 25-35 PSI
Absolute Minimum 15 PSI

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Hot & Cold Water

4-5 Gallons/Meal Served/Day; 55% of water used at peak period
 28% *before* service 17% used *after* service.

Hot Water

.20-30 GPH/Sq./Ft. (Max. water hardness recommended for dishwashing is 6 Grains or 100 PPM); Separate Lines 120°F. Handwash/140°F. Pot & Dishwash/Laundry Washes 50 PSI Minimum Pressure.

Exhaust for Cooking Equipment

3-4 CFM/Sq. Ft. of Production Area
 250-350 CFM/Lin. Ft. of Cooking Equip. for UL Rated Hoods
 300-400 CFM/Lin. Ft. of Cooking Equip. for Non-Rated Hoods
 Exhaust Velocity 1500 to 2200 FPM ((1800 FPM Optimum)
 Make-up Air 70% of Exhaust Tempered to 45° Min.

Do not provide un-tempered make-up air to hoods. Short-circuit make-up air hoods are not recommended.

Handwash Sink

1 per Work Station or per 10 Ft. Radius is now required in many areas including Florida and California
 1 per Work Station or per 15 Ft. Radius minimum

Waste Discharge

2½ -3 Gal. Per Meal Served
 4 Gallon per Patron for Toilet Use

460/480 Volt equipment is not recommended for most kitchens because of more limited availability of spare parts in most areas, extra cost from many manufacturers, and potentially greater fatal shock hazard than 208 Volt equipment.

Fuel Gas

.35-40 MBTU/Sq. Ft
 5-6" W.C. Recommended
 4" Minimum/7" W.C. maximum

Electrical

25-30 Amps/Sq. Ft.	
120 V/1 Phase	.15-.20 Amps/Sq. Ft.
208 V/1 Phase	.04-.05 Amps/Sq. Ft.
208 V/3 Phase	.06-.10 Amps/Sq. Ft.



RECOMMENDED KITCHEN MATERIALS AND FINISHES

Ceilings

Smooth vinyl coated washable lay-in tiles in aluminum, or vinyl cover installed in an aluminum or PVC 2 x 2 grids. Steel grids rust and 2 x 4 tiles warp when subject to heat and humidity leaving gaps at ends of the tile.

In open or display kitchens or anywhere noise is a concern, consider washable high acoustic absorption lay-in ceiling tiles from Ecophon CertainTeed. (215-619-2818 / www.ecophonact.com).

Flooring

Raised point texture slip-resistant thickset quarry tile, like Crossville "CrossGrip" Thick set quarry tile is highly recommended in commercial and institutional kitchens because of the heavy rolling loads from banquet and meal delivery carts. This also allows the floor to pitch to floor drains and ramp to walk-in coolers, often eliminating the need for floor depressions. These products are the reference standard for virtually all major chain restaurants from quick service to fine dining.

Where the tile floors are not feasible, we suggest "Protect-ALL" industrial Sheet Vinyl floor. Available in tiles and 5 x 8 ft sheets with welded seams and coved corners, this ¼" thick 100% recycled product is waterproof, chemical resistant, and provides excellent slip resistance and sound absorption. It also reduces the need for separate fatigue mats in the kitchen.

Poured or troweled on floors are definitely not recommended for long-term applications in floors with heavy traffic or in dishwasher and potwash areas. They should never be installed over existing tile floors. Seamless vinyl floors are easier to maintain and repair.

Walls

Ceramic Tile with epoxy/acid resistant grout or FRP panels (Fiberglass Reinforced Plastic). Install on moisture resistant green board in general areas/ cement tile backer board behind cooking, dish, and potwash areas. Walls behind cooking equipment should have stainless steel wainscoting.

Lighting

Recessed covered daylight fluorescent in moisture resistant enclosure except in serveries and display kitchens, which should be incandescent or halogen. Many health codes mandate specific lighting levels higher than normal office or utility areas. Requirements should be carefully verified.

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STRUCTURAL LOADING

Typical Foodservice Equipment Weights

Dry Storeroom	150-250 PSF
Walk-in Cooler	(Loaded) 90-100 PSF
General Kitchen Areas 120 PSF	
Wall Shelves	5 Lb./Linear Ft.
Pot Rack (Avenue)	750 Lbs.
6 Ft. High Wine Rack	300 Lb./Ft.
Condensate Hood	40 Lb./Linear Ft.
Wall Mounted Filter Hood	65 Lb./Linear Ft.
Island Filter Hood	115 Lb./Linear Ft
Wall Mounted Water Wash Ventilator	85 Lb./Linear Ft.
Island W.W. Ventilator	170 Lb./Linear Ft
Reach-in Refrig./Warmer	500 Lb./Section
Steam Kettles	Concentrated Load Up to 700 Lb.
Large Mixers (60-120qt)	Concentrated Load Up to 180 Lb.

Provide wall backing for wall shelves and cabinets.

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SOLID WASTE (Average Pound Generated Per Day)

Clubs	2 Lb./Meal Served
College/Employee Cafeteria	.75 Lb./Meal Served
College Residence Hall	3 Lb./Resident
Hospital	16 Lb./Occupied Bed
Institutions	3 Lb./Person
Nursing/Retirement Homes	5 Lb./Person

Each 250lb. of Waste = 1 Cu. Yd. of Waste. Trash Compactors Range from 5 to 40 Yards - Garbage Compactors reduce waste volume up to 66%. Bailers and Pulper reduce waste volume up to 80%.

Lodging

First Class/Resort	2.5 Lb./Guestroom + 2 Lb./Meal
Business Class	1.8 Lb./Guestroom + 1.5 Lb./Meal
Limited Service	2 Lb./Guestroom

Restaurants

Fast Service	2.0 Lb./Meal (assumes disposables)
Cafeteria/Coffee Shop	1 Lb./Meal (with permanent trays & service wares)
Cafeteria/Coffee Shop	2 Lb./Meal (disposables)
Fine Dining	1.5 Lb./Meal

School Cafeteria

.5 Lb./Student (with permanent ware)
1 Lb./Student (with disposables)

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HELPFUL HINTS TO MAKE YOUR PROJECT MORE SUCCESSFUL

Codes – Make sure equipment meets local code requirements

Most codes require that all commercial kitchen equipment have UL (Electrical/Ventilators), AGA (Gas), and NSF (Sanitation) labels. There are a number of products on the market missing one or more of these labels which can cause serious problems for the owner or architect if they are specified or approved as alternatives and are rejected by the local authorities.

Utility Rough-ins – Utilities should drop down / not stub up

It is strongly recommended that all plumbing, electrical, steam, and non-gravity related utilities drop down wall and chases to points of connection rather than stubbing up from the floor. This allows much more flexibility in relocating or changing equipment, eliminates cleaning difficulty caused by rough-ins to areas below. It also reduces the risk of trip hazards from utilities that extend into aisles or beyond counters or tables.

Walk-in Coolers – Avoid ramps, steps, and metal floors

Coolers with 4" thick metal floors often warp and deteriorate before the cooler walls. Often moisture goes under the floor and creates odor problems. Steps and ramps to access coolers make it difficult for employees and create slip and hazards. Coolers on grade can be installed floorless with tile floor. Above grade, coolers are with special 2" stainless floors that require only a minimum ramp.

Wall Protection in Service Corridors and BOH Areas

We discovered that the best and most effective place to put wall protection is right on top of the tile or vinyl base (4-6" AFF). While tables and carts may mar or scratch a wall at 30-36 AFF, the real serious damage occurs at 4-8" AFF. This is where the hardware (including the brakes on the casters) from large shelf trucks, food delivery carts, pallets, dollies, chair and table carts, furniture movers, etc. hit walls with great impact.

When damage occurs at 4-8" AFF it usually gouges, cuts and fractures the wall. It also cracks or damages the tile base. This damage is far more difficult to repair than scratches or dents at 36" AFF. It also provides easy access for vermin to enter the walls. Consider that a mouse or rat will not jump 36" into a notch or small hole in the middle of a wall.

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A word about kitchen design provided by suppliers or vendors

Some owners believe that using a dealer or equipment supplier to design a kitchen will cost less than an independent consultant or architect specializing in foodservice design. In reality, the savings in fees are offset by increased cost due to the following:

Vendors encourage bigger kitchens and more equipment. Designing tight efficient kitchens requires much more time and effort, with less return since the equipment budget is smaller. There is no incentive for vendors to reduce kitchen cost or space.

When a vendor designs a kitchen it is difficult to get accurate pricing from other bidders, since the vendor determines the level of quality, and controls the details and finishes. The vendor who designs the facility can change the requirements after the award of a contract and supply whatever they want. Few owners or operators have the time or skill to verify stainless steel grades and gauges or verify quality levels of alternate or substituted products. For this reason many qualified bidders won't bid a project designed by another vendor and the advantages of receiving multiple bids proposals are lost or diminished.

When equipment is bid using unbiased and performance oriented specifications, the final competitive bid prices are typically 8-10% less than on projects priced from cutbooks or vendor specifications. This savings more than offsets the cost of an independent consultant.

Even if you are comfortable with a supplier designing and bidding a project, always ask the questions: "*Who determines if substitutions in quantities and quality are made? Who checks the shop drawings, submittals, and makes final inspections of the work completed?*" Are you prepared to add this responsibility to your busy schedule?

IMPORTANT

The information contained in this guideline is offered to assist architect and engineers in programming and pre-design efforts. The information must be adjusted to project specifics, local codes, and field conditions. We urge you to retain an independent foodservice consultant to assist in the equipment planning and specification.

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