



PLANNING FOR DINING EXCELLENCE



AIR COMBAT COMMAND
MORALE, WELFARE, RECREATION, and SERVICES



■ DINING FACILITY EXCELLENCE



Dedicated people, satisfied customers, and state-of-the-art facilities are essential elements of a quality centered organization - the focus of Air Combat Command. Functional, attractive dining facilities are key to our commitment to provide the men and women of Air Combat Command a quality service and healthy food in a comfortable dining environment.

The Planning for Dining Excellence Brochure provides command standards for our dining facilities. Meeting these standards will enable your food service staff to continually improve customer service.

I ask commanders and managers at all levels to incorporate dining facility improvements as a high priority in their installation goals. The Planning for Dining Excellence Brochure will aid immeasurably in achieving quality Food Service Operations that we seek in Air Combat Command.

A handwritten signature in black ink, reading "John M. Loh".

JOHN M. LOH
General, USAF
Commander

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■ DINING FACILITY EXCELLENCE



Elevated Seating

Purpose of Brochure

This brochure is designed to provide a basic outline on "How To" construct new facilities or renovate existing facilities. It identifies all areas that should be considered and the ACC standards that must be met. Designed for quick and easy reference, this brochure can be an effective source of guidance for both the experienced as well as inexperienced facility manager.

Preparation of Brochure

The technical expertise of HQ ACC MWPC, MWFF, and CETSO, along with the expertise of our "Winners" (recipients of the John L. Hennessy trophy) were combined to develop this brochure. While most of the information is a cross-flow of ideas, the greatest assets are the pictures, which are indeed, "Worth a Million Words". They reveal the professionalism and pride displayed by today's Air Force Food Service personnel.

INTRODUCTION ■

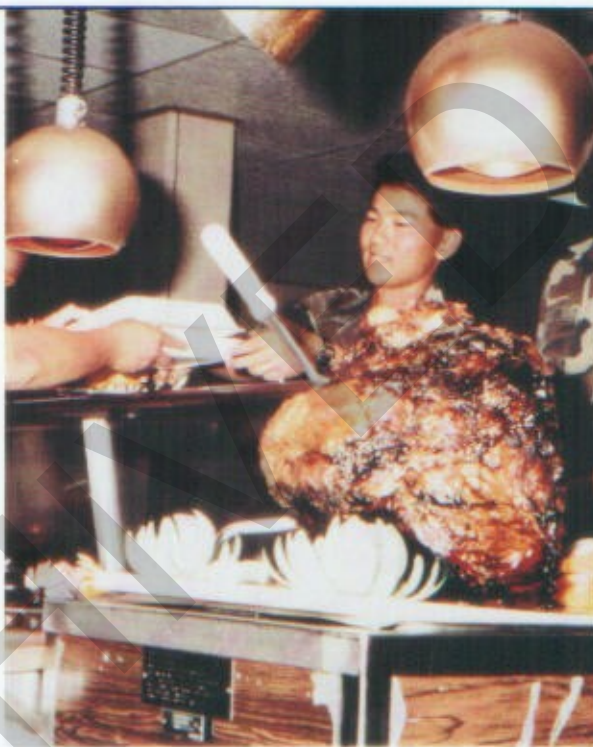
Goals

It is our goal to help you, the user, build and maintain aesthetically designed yet functionally equipped facilities that:

1. Provide patrons a place in which to dine where food, customer service, and atmosphere are comparable with quality commercial food service establishments.
2. Encourage pride and professionalism in our Food Service personnel while enhancing their skills and abilities.



Quality and Variety



Culinary Pride

How To Use

To maximize the effectiveness of this brochure, we recommend that copies be kept with other pertinent and supplemental material. Additional information, formulas, and a reference section on Who To Contact, have also been included for your convenience. It is our intent to make this a workable tool, supplying the user with a viable production guide.

DINING FACILITY EXCELLENCE

SITING

General Requirements

- Dining facilities should be sited where they can conveniently serve the majority of the customers for which they were constructed.

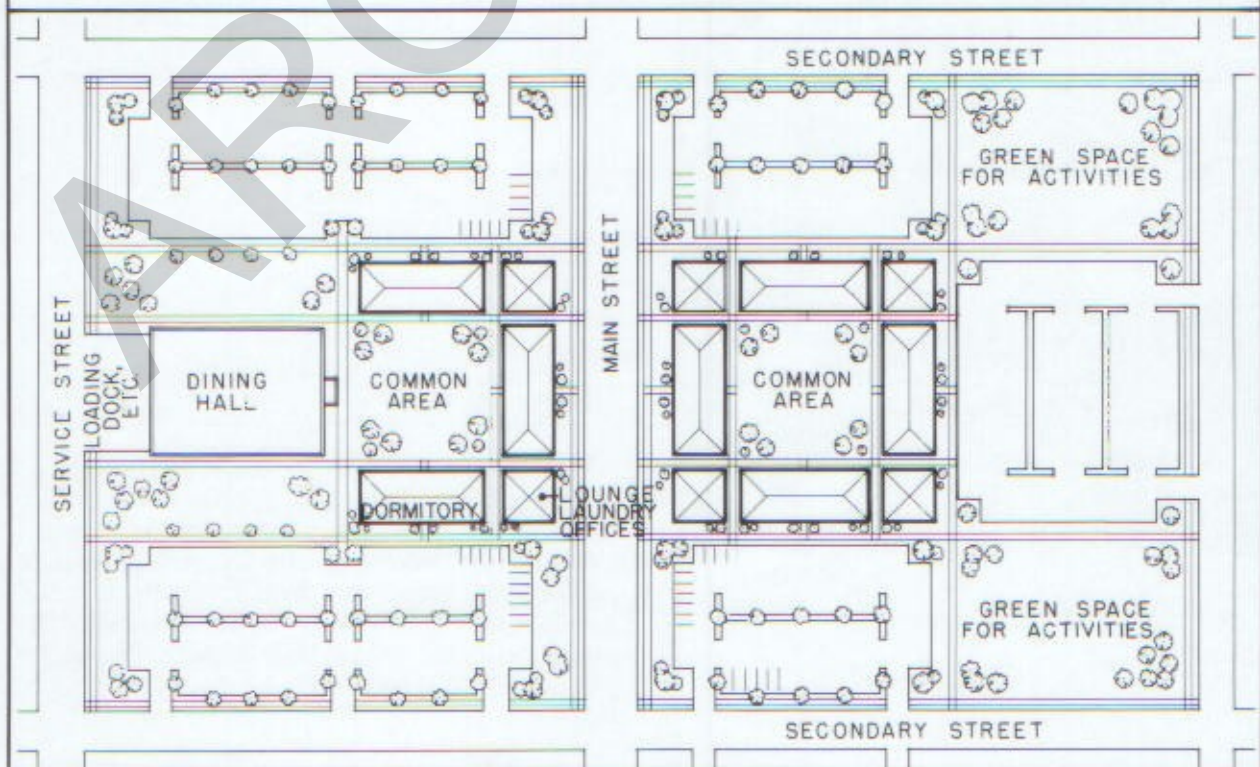
When a secondary dining hall is authorized, consider locating it near major work centers.

- Create a professional atmosphere with dining facilities as the hub of the dormitory complex.

Align new facilities to provide pleasing views of the building entry from high traffic streets.

Plan for facility expansion.

Loading dock areas should be out of view from mainstream traffic, yet serviceable by 40-foot trailers.



FACILITY SITE PLANNING ■

LANDSCAPING



Low Maintenance Landscaping

General Requirements

- Landscaping has an enormous impact on base appearance. The wise use of trees, shrubs, and grass can create pleasant and stimulating surroundings in which to work and live.

- Provide an attractive, low-maintenance landscaping environment.

Ensure professional landscaping is included in new facility construction.

Landscaping must complement the facility and appear natural.

Take advantage of the existing environment.

Preserve natural aesthetic features.

Don't create bermed land forms against exterior walls.

- Select hardy, indigenous plants which are easily maintained.

Drought resistant.

Use coniferous or other perennial trees for year-round color.

Avoid short-lived plants.

- Provide interconnected walkways between dining facilities, dormitories and office buildings.

- Ensure that landscaping is well maintained.

Include landscaping in annual budget requests.

Update and follow existing landscape development plans.

■ DINING FACILITY EXCELLENCE

PARKING

General Requirements

- Provide functional, landscaped parking lots which reduce the visual impact of parked cars.

Consider traffic flows for parking location and entry/exit points.

Use buildings and landscaping to screen parking areas from view.

Provide sidewalks and curbs and gutters around parking areas.

Use several smaller parking areas rather than one large area.

Do not let parking dominate.

Provide parking for 10% of the rated capacity.

Provide parking for 40% of largest shift.

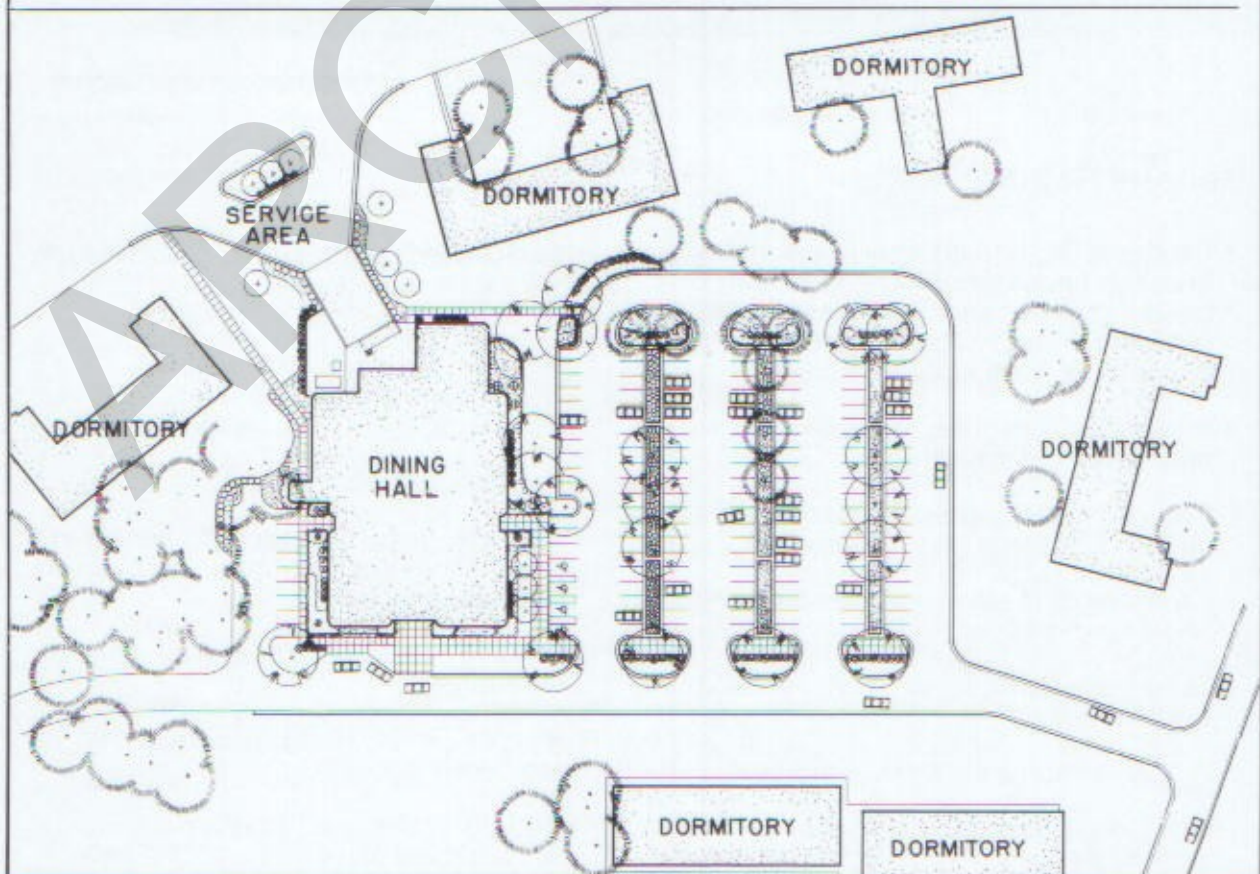
Locate employee parking near service areas away from patron parking.

- Avoid parking at building entrances.

Patron drop-off area may be provided.

Entries should be 200 feet or less from parking lot.

Provide areas for parking of motorcycles and bicycles.



FACILITY SITE PLANNING ■

LIGHTING AND SIGNS

Lighting

- Professionally lighted buildings and signs are a visible statement about the pride and professionalism of ACC installations.

- Adequately light building exteriors, walkways, and parking lots for safety and security.

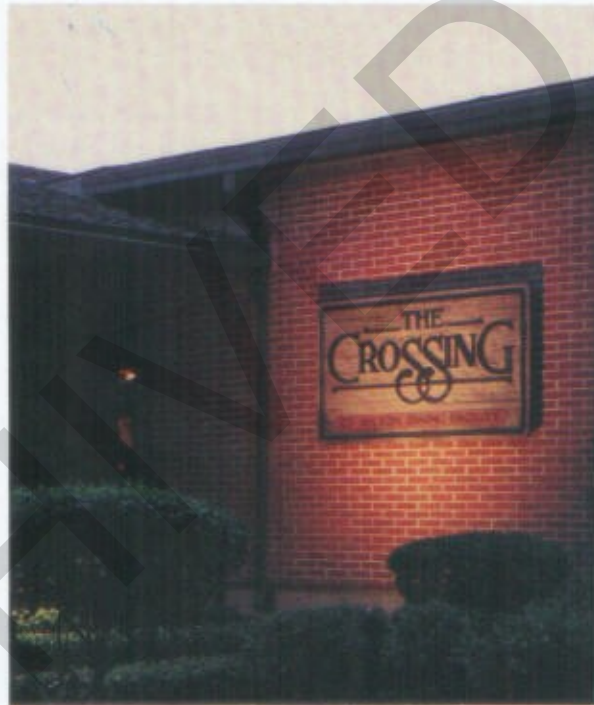
Light building signs at night.

Control exterior lights by a photocell.

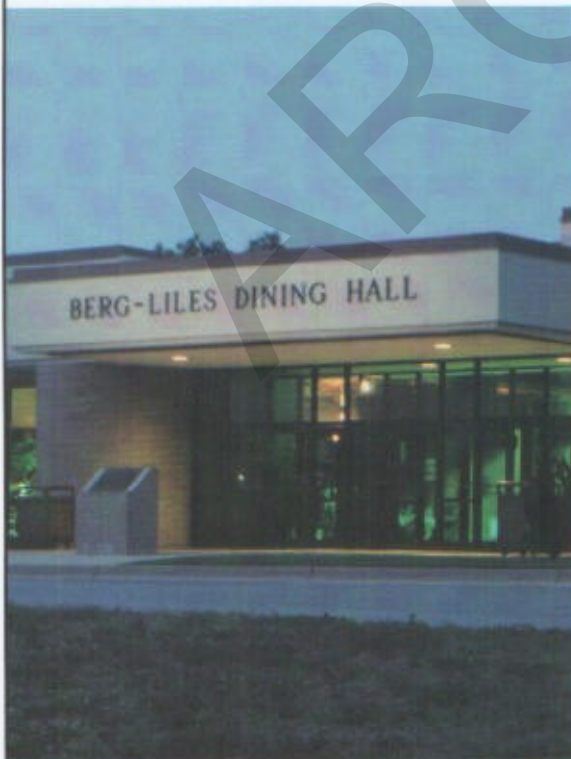
- Lighting should be attractive as well as functional.

Compliment landscaping and parking with flood and accent lighting.

Highlight positive features such as entrances and signs.



Sign With Accent Lighting



Signs

- Ensure ACC signs are professional, well maintained and properly located.
- Follow standard sign format, color and size as specified in ACCR 88-1 and 88-3.

Identify buildings with freestanding or building-mounted signs.

Ensure individual letter-type signs are readable from high traffic streets.

Strictly limit reserved parking signs.

Avoid prominent building numbers on the facility.

- Place sign with hours of operation near entry.

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EXTERIOR FINISHES

General Requirements

- **Coordinate architectural design with surrounding buildings.**

Develop repetitive architectural elements that tie buildings together, such as windows.

Relate building forms to each other and use low maintenance masonry materials.

Avoid monotony. All buildings do not have to look alike.

Create inviting entries.

Integrate appearance of doors and windows with exterior design.

Western Architectural Design

- **Reduce life cycle costs.**

Improve energy efficiency.

Provide all outside doors with air curtains except emergency exits.

Provide operable sashes with screens and safety glass.

Finishes

- **Provide exterior finishes of durable, easily maintained, attractive materials.**

On new construction, use integrally colored brick, split faced block, ribbed block, rough-textured exposed aggregate or precast textured panels.

On existing facilities, exterior insulation systems may be used.



FACILITY EXTERIORS ■

Avoid using exterior finishes that require painting.

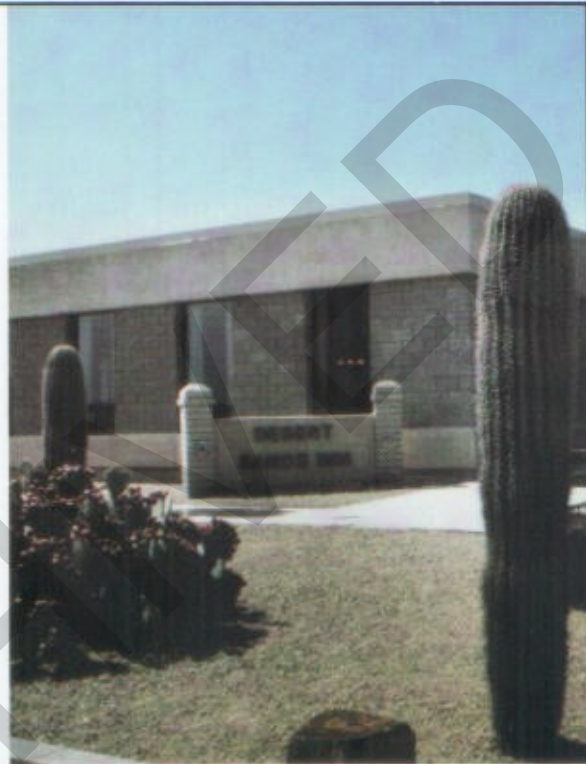
Use earth tones, such as beige, sand, tan, brown, and rust.

Use dark bronze anodized aluminum windows.

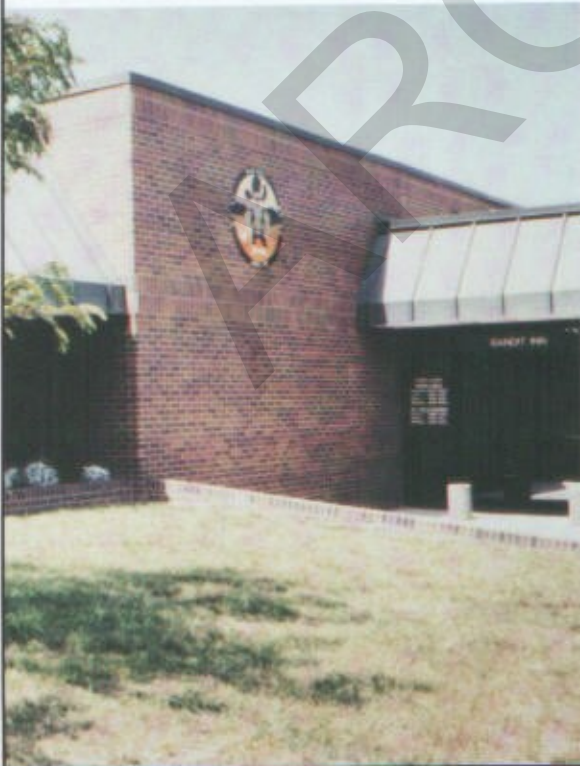
Do not use shiny metal finishes for doors, window frames, louvers, handrails, etc.

- **Tastefully paint non-masonry materials that are not factory finished.**

Use accenting colors for trim.



Low Maintenance Masonry Walls



- **Deemphasize mechanical rooms and dumpster locations.**

Screen dumpsters and HVAC units with architecturally compatible walls, treated wood fences or landscaping.

- **Provide convenient, discretely hidden newspaper stands and trash receptacles.**

Do not allow cigarette butt cans and newspaper stands near building entries.

Match trash cans to the exterior building finishes.

■ DINING FACILITY EXCELLENCE

ENTRIES



Layout

- Attractive, functional dining room entries provide pleasing first impressions of the overall dining facilities and the quality food being served.

Provide attractive appropriate signage to direct patrons to proper food lines.

Locate the waiting area adjacent to the main entrance.

Locate restrooms in a convenient but discrete location.

Pleasant First Impression



Finishes

- The exterior entrance to the dining facility must be attractive, inviting and immediately apparent from the parking area.
- Use entrance and foyer areas to make good first impressions.

Provide vestibule with double doors for energy conservation.

Use entry floorings of non-slip quarry tile.



Spacious Entrance



■ DINING FACILITY EXCELLENCE

DINING ROOMS



Layout

- Dining halls must have an appealing and relaxing atmosphere that fosters customer satisfaction.
- Dining rooms must provide functional layouts which are easily maintained, offer varied seating styles, and attractive coordinated finishes.

Incorporate exits in design. Do not add as an after thought.

- Use AFM 86-2 and AFR 146-7 to size dining rooms.

If two dining rooms are being built, plan for separate themes.

Formal and informal dining rooms may be planned.

Various Themes



FACILITY INTERIORS ■



Provide Seating Options

Break up dining areas to avoid large cafeteria room effect through raised platforms and planters.

Incorporate windows in effort to create a pleasant dining atmosphere.

Conceal all mechanical and electrical conduits, ducts, etc.

Baffle noise from serving line and dishwashing room.

Provide alcoves for bus carts.

- **Provide a central music/paging system with coordinated speakers.**

■ DINING FACILITY EXCELLENCE

DINING ROOMS



Coordinated Finishes

Finishes

- **Coordinate finishes to express a single theme in each dining area. Ensure major projects have a comprehensive interior design accomplished.**

Use materials and furnishings which are durable, maintainable, and of commercial quality.

Carpet dining rooms in accordance with ACC standards.

Select vinyl wall coverings and window treatments to provide easily maintained surfaces.

Select neutral colors for various finishes.

- **Suspended ceilings must be 2'x2' off-white, integrally colored panels with recessed grid.**

Use 9 to 10 foot ceiling heights.

Use varied ceiling heights and materials, as well as light fixtures to accent dining room layout and theme.

Provide lighting on multiple dimming systems.

Use natural lighting whenever possible.

Avoid fluorescent lights.

Furnishings

- **Furnish dining rooms with attractive furniture suitable for the purpose.**

Vary seating styles with a combination of booths and square and round tables.

Provide tables with varied seating numbers.

Select chairs for their comfort, design, construction and durability.

Do not use fast food type seating and tables.

Durable, Attractive Furniture



■ DINING FACILITY EXCELLENCE

SERVING LINES



Layout

- **Serving lines must serve the customer in the most efficient and pleasing way possible.**
- **They must be efficiently laid out, easily maintainable and properly equipped while presenting an attractive appearance.**

Provide direct, efficient access from main building entry into serving line.

Serving line entry must not be through dining room.

Ensure efficient traffic flow with cold food, hot food, beverages and condiments in their proper order.

Provide plates before food and cups, ice and glasses before beverages.

Develop floor plans with sufficient room to resupply food lines from behind.

Facilitate Customer Flow

Locate carbonated beverages and CO2 containers away from the dispensers.

Provide room for expanding cashier functions at peak serving times.

Allow sufficient room for SIMS equipment.

Finishes

- **Select finishes for maintenance durability, impervious surfaces and attractiveness.**

Floors of non-slip quarry tile.

Use light colored ceramic tile walls.

Accent tiles that compliment decor are appropriate.

Corner bumper guards are encouraged.

Use washable ceiling tiles with recessed lighting fixtures.



Attractive Menus

Incorporate decorative panels into serving lines. Avoid the institutional stainless steel look.

Equipment

- Provide serving line equipment that is professional, high quality and easily maintainable.

Develop project to have contractor furnish and install equipment.

Provide attractive menu boards with slide in words.

Provide each serving line with one hot and one refrigerated pass through.

Provide tray slide rails and protector cases.

Have well placed adjustable heat lamps to keep food hot.

Provide background music in serving line area.

Conceal all utilities. Provide floor and wall electrical outlets.

Power poles are not allowed.

Provide floor drains.

Provide stainless steel kitchen equipment and shelving.

Locate kitchen equipment six inches from walls to allow proper cleaning.

Pleasing Display



■ DINING FACILITY EXCELLENCE

KITCHENS



Layout

- Kitchens must be functional and properly equipped with adequate work and storage areas.
- Develop equipment layout based on anticipated menus.

Kitchen layout assistance is available if desired.

Provide a short order and sandwich preparation center near informal dining rooms.

Finishes

- Design kitchen finishes with hard, impervious surfaces which may be easily cleaned and maintained.

Develop kitchens with 10 to 12 foot high ceilings.

Construct floors from non-slip quarry tile.

Provide 6' high ceramic tile wainscoting.

Provide water resistant gypsum board ceilings with recessed lighting.

Round or cove all building and equipment corners for ease of cleaning.

Equipment and Utilities

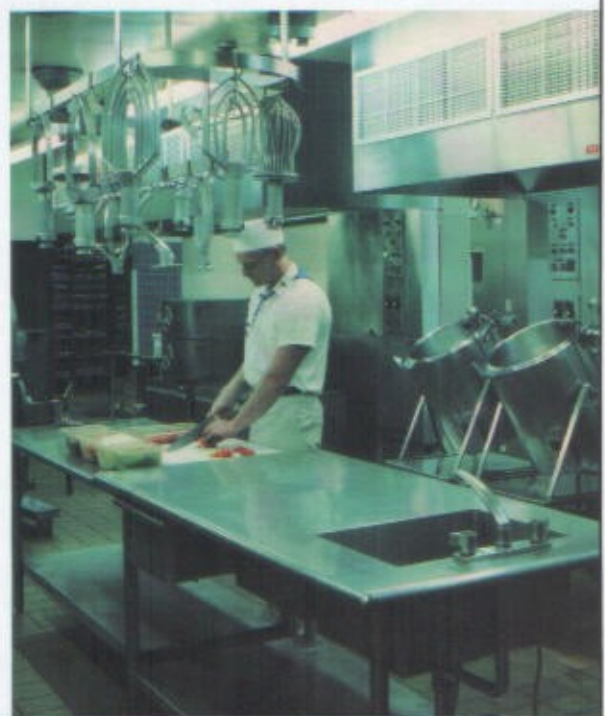
- Provide kitchens that are adequately equipped, efficient and well laid out.

Develop projects to have contractor furnish and install all kitchen equipment.

Provide emergency power generator hook-up.

Allow for expansion, with sufficient electrical capacity.

Arrange Equipment for Maximum Productivity and Efficiency





Dishwashing Room

Provide spot air-conditioning or evaporative cooling as required.

Allow for adequate kitchen equipment drainage.

All exhaust hoods shall have automatic washdown systems.

Provide walk-in freezer fronted by chilled refrigerator.

- Use standard three-compartment sink with heater booster and temperature gauge to wash pots and pans.

Avoid pot and pan washers.

Provide space for drying and storage of pots and pans.

Sealed vapor recessed lighting shall be used in pot/pan room.

- Dishwasher shall have the capability to boost water to 180 degrees.

Storage/Loading Dock

- Size and locate storage and loading dock areas for maximum efficiency.

Locate dry storage room near kitchen receiving/loading dock.

Locate storerooms to prevent transporting of cartons through kitchen.

Dry food storage must have ample ventilation and heat to prevent freezing and food spoilage.

- Provide adequate and effective screening for the kitchen receiving/loading/service area.

Provide 4'-0" high loading dock for semi-trucks.

Locate wet garbage room near loading dock.

Provide concrete slab and apron for three dumpsters.

Portable Storage Racks



■ DINING FACILITY EXCELLENCE

OFFICES/LOCKERS

Layout

- Provide offices and administrative spaces as required for the scope of each facility.
- Locate supervisor offices near kitchen.

Locate music and paging system controls in office.

Provide area for SIMS terminals and printers.

Finishes

- Finishes in office spaces are to be determined by office locations.

Provide impervious surfaces when office is near food and water sources.

Provide carpet and vinyl wall fabric when offices are located away from food sources.

- Provide employee restrooms and changing areas.

Provide a locker for each employee.

Adequate Office Space



UTILITIES

Mechanical Requirements

- Utility services are the backbone of any ACC installation. Careful placement will ensure success of dining hall's ability to maintain a professional appearance.
- To promote professional appearance in ACC dining halls, the Command challenges its people to provide utility systems which are unobtrusive and architecturally compatible.

Heating and air-conditioning ducts and piping are to be run unexposed.

All plumbing pipes are to be concealed above ceilings or in chase walls.

Paint unattractive objects to blend with surrounding finishes.

Do not use shiny metal finishes for louvers or grilles.

Screen HVAC units and transformers with architecturally compatible walls, treated wooden fences or landscaping.

Screen Wall For Mechanical Units

Fire Protection

- Fire protection and security are crucial functions.

Provide wet chemical hood suppression system that automatically turns off hood, releases chemical and signals Base Fire Department.

Fire alarms must be heard in every room.

Provide recessed fire extinguishers in all kitchens.



Electrical Requirements

Make dining rooms inviting with indirect lighting.

Do not expose conduit.

Paint fuse and circuit breaker boxes to match surrounding decor.

Provide GFI outlets for kitchens and serving lines.

- Fire detection devices need not detract from facility appearance.

Use recessed or flush-mounted sprinkler heads.

Paint fire alarms, bells, and horns to match the surrounding interior finishes.

Do not paint over fire alarm pull stations, operating instructions on manual pull stations, or duct activating devices.

■ DINING FACILITY EXCELLENCE

EXPANDED FLIGHT KITCHENS



General Requirements

- Expanded flight kitchens provide ACC flight line employees hot meals close to their work areas.

The modular and second generation expanded flight kitchen (EFK) designs meet our flightline food service requirements.

- The second generation EFK designed like commercial fast food restaurants is the ACC standard.

Provide multi-cashier/food server stations.

Cashier to receive cooked food items by passing food from kitchen to cashier through pass-through window.

Provide interior and/or exterior dining areas.

Provide restrooms for interior patron use.

Accommodate the Patron

Dining Room Finishes

- Use materials and finishes in dining areas which are durable, maintainable and of commercial quality.

Limit carpet use to seating areas.

Use quarry tile floors with coved quarry tile base in high traffic areas.

Use vinyl wall covering.

- Suspended ceilings must be 2'x2' off-white, integrally colored panels with recessed grid.

Use varied ceiling heights and materials, as well as light fixtures to accent dining room layout and theme.

EXPANDED FLIGHT KITCHENS ■

Dining Room Furnishings

- **Furnish dining areas with attractive furniture suitable for the purpose.**

Provide commercial quality booths, table and chairs.

Vary seating styles and layouts.

Kitchen Layout

- **Provide kitchens that are adequately equipped, efficient and have a well planned layout.**

Provide room to prepare fast food menu items as well as flight meals.

Provide office for kitchen manager.

Provide lockers and restrooms for all employees.



Kitchen Finishes

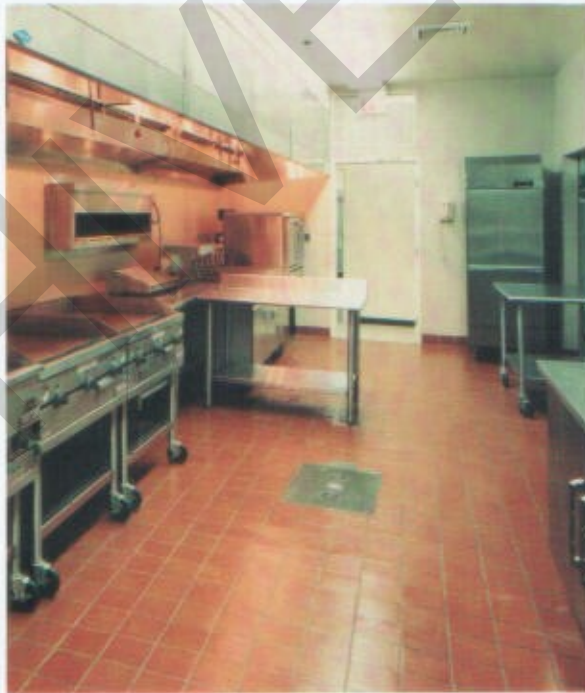
- **Provide kitchen surfaces which are impervious and easily maintained.**

Quarry tile floors and base are to be used throughout kitchen.

Provide hard, smooth impervious walls and ceilings which are easily cleaned.

Provide moisture proof general lighting.

Flight Kitchen



Kitchen Equipment

- **Provide kitchen equipment and utilities necessary to prepare fast food menu items.**

Provide commercial quality, stainless steel equipment.

Provide necessary outlets for equipment hook-up.

Equip all exhaust hoods with automatic wet chemical fire extinguishers and washdown systems.

Use sealed vapor lighting in fume hoods.

■ DINING FACILITY EXCELLENCE

MODULAR EXPANDED FLIGHT KITCHENS

- **Kitchen equipment and internal layout should provide an efficient operation for preparing and holding fast food items.**

A large grill, three compartment deep fat fryer with filtration, food warmer and refrigeration are major equipment items.

Provide adequate perishable and non-perishable storage. Allow for expansion and the use of outside storage systems.

The facility should be well ventilated with an HVAC system capable of handling heat generated in a relatively confined area.

Provide sufficient outside lighting for night operations.

Funding limitations do not allow for parking lot construction, therefore, modular EFKs should be sited within walking distance of flightline work areas or next to existing parking.

Do not forget landscaping and exterior appearance compatibility with surrounding facilities.

- **The modular EFK provides installation commanders a viable alternative to the second generation EFK.**

A compact facility, centrally located in the flightline area, can be built within the minor construction and O&M funding parameters.

The facility should be sized to support 300-500 carry-out meals daily.

Provide for separate order and pick-up stations. This area should be, as a minimum, under cover or within the facility for patron comfort. An intercom/speaker system is encouraged to announce ready food orders.

Covered outdoor seating is desired using durable, low maintenance type tables and benches.

Modular Expanded Flight Kitchen



SATELLITE DINING FACILITIES ■

SATELLITE DINING FACILITIES

General Requirements

- Fire station dining facilities enable fire fighters to remain with their equipment for quicker response.

Dining room must provide relaxing and appealing atmosphere.

Coordinate finishes to express a single theme.

Provide easily maintained surfaces.

Dining room size and number of tables and chairs are to be determined by largest shift of employees.

Include area for salad and beverage bars.

Kitchen Requirements

- Kitchen facilities shall be provided for reheating of prepared foods.

Provide equipment for reheating and warming prepared foods.

Provide lockable food storage closet for food service personnel.

Provide stainless steel kitchen equipment.

Select finishes to provide easily maintained surfaces.

Satellite Dining Area



KITCHEN LAYOUTS

500 PERSON DINING HALL

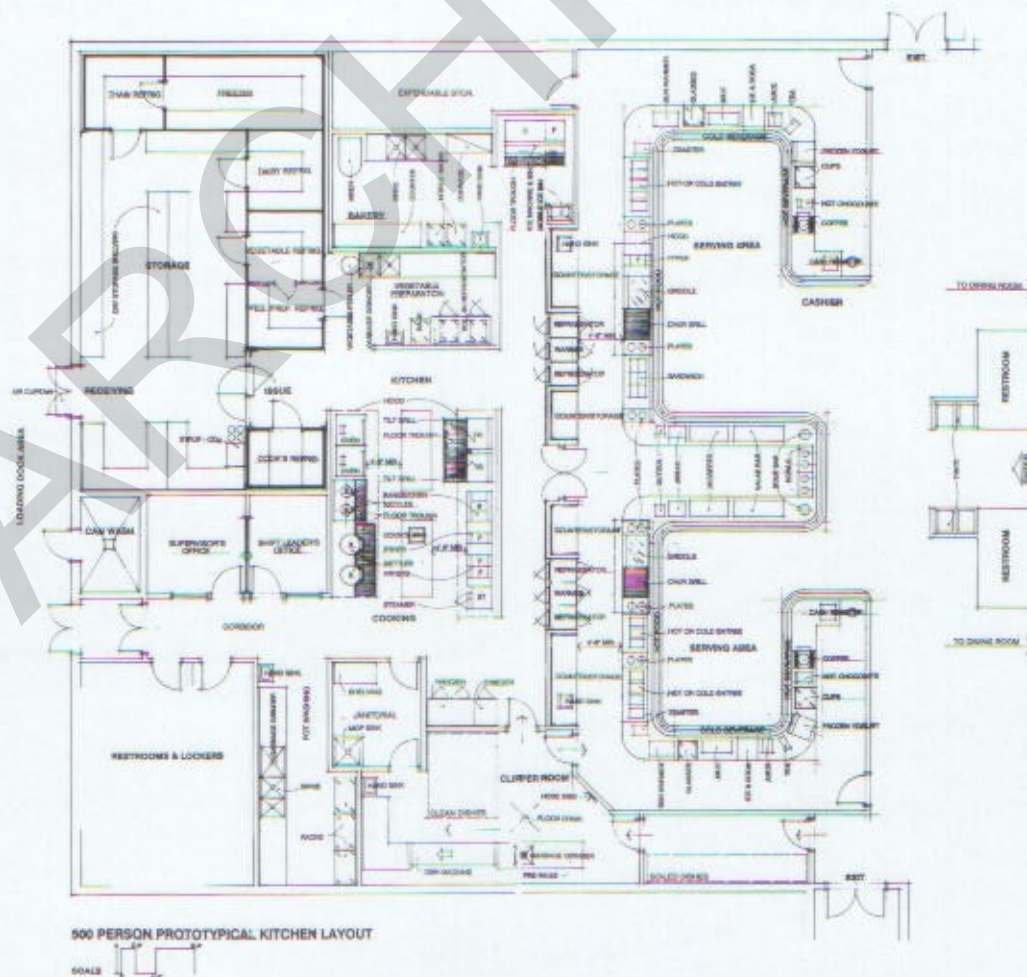
Design the layout of the kitchen to maximize efficiency. The layout should allow the staff to minimize their actions.

Consider the flow of food through the kitchen when designing the layout. Food enters the kitchen from the loading dock and is kept in the walk-in and storage area in the rear of the kitchen. Cooks in the main cooking and vegetable preparation areas require easy access to these storage areas. Once prepared, food passes to the serving line via the pass-through refrigerators and warmers.

Locate pass-throughs so they maximize efficiency between the cooking areas and the serving line.

Key Issues

- The bulk and multipurpose cooking and bakery areas share common areas of flow.
- Provide easy access from the main production area to the storage, bakery, administrative, and serving areas.
- Provide a full height wall behind the multipurpose cooking battery to prevent food preparation sight and sound from disturbing patrons in the seating area.



KITCHEN LAYOUTS ■

1000 PERSON DINING HALL

Locate the clipper area so that it is convenient to both the dining room and the serving line.

Provide utility rooms in addition to the standard cooking, cleaning, and storage areas.

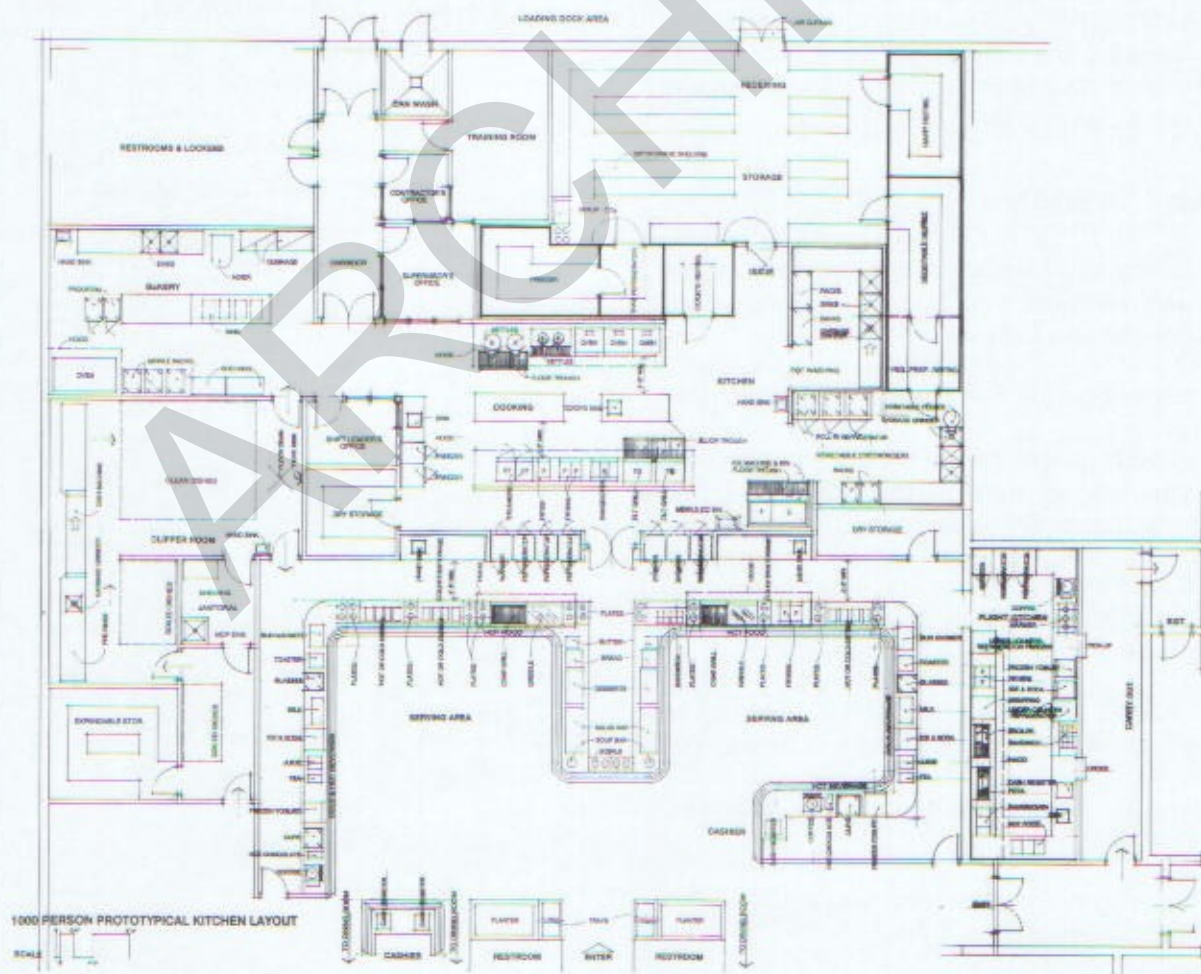
Provide a dedicated training room to accommodate the increased emphasis on employee training requirement.

Provide separate employee restrooms, lockers, and breakrooms.

Provide an office from which the shift supervisor has easy access to all parts of the kitchen.

Key Issues

- Provide separate shift leader and contractor offices.
- Include an attached flight kitchen.
- Provide easy access from the main production area to the storage, bakery, administrative, and serving area.
- Provide a full height wall behind the multi-purpose cooking battery to prevent food preparation sight and sound from disturbing patrons in the seating area.



■ SERVING AREA

SERVING LINES

The serving area is the customers' window on the kitchen operation. The serving line separates the customer service area from the prepared food holding area behind the line.

The serving line consists of hot food wells, refrigerated sandwich units, charbroilers, grills, carving stations, and hot and cold beverage dispensing equipment at the end of the line.

Provide for mobile cooking equipment at the front of the line for maximum flexibility. The charbroilers can be replaced by additional flat grills for serving eggs, or the hot food wells can be replaced by refrigerated cold tables for serving cold taco condiments.

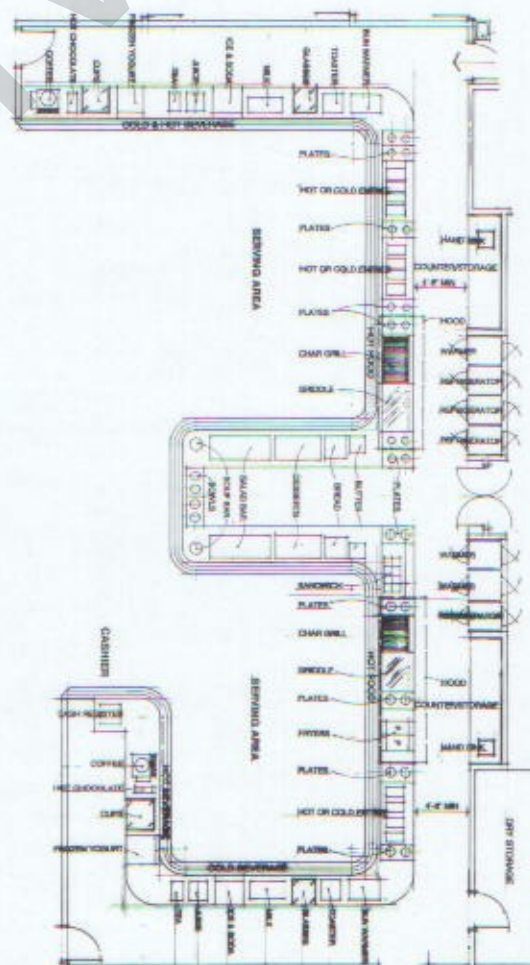
Install utilities at regular intervals along the serving line to increase serving line flexibility; these include 110 and 220 volt outlets, flexible indirect waste lines, and flexible gas lines with quick disconnects.

Key Issues

- Design enclosures for pass-through warmers and refrigerators so that the equipment does not protrude into aisles.
- Select equipment with recessed door handles.
- Provide ample space behind the beverage counters to service the equipment and dispensers without disrupting the serving line.
- Specify ice dispensers with ice-making capability and soda and water dispensing heads to reduce labor requirements.
- Provide utilities for and install only mobile equipment, including hot and cold food tables.
- Specify glass doors on reach-ins and pass-throughs.
- Specify horizontal handles on all reach-ins and pass-throughs.



Increase layout flexibility with mobile equipment.



SERVING AREA ■

- Provide easily accessible 110 and 220 volt electrical outlets in addition to those required for the original equipment.



Provide space behind the counters to service equipment.

Hot food wells can be easily replaced by refrigerated units.



■ FOOD PREPARATION

FUNCTIONAL AREAS

The food preparation area includes a multipurpose cooking area with steam equipment, ovens, and fryers; a vegetable preparation area with a slicer, chopper, peeler, and reach-in refrigerators; a bakery; and the ice machines.

Cooking Area

Arrange this area so that the operators can easily see all of the cooking equipment from one location.

Arrange the equipment, consisting of convection ovens, braising pans, steam kettles, deep fat fryers, and steamers, into two parallel rows facing one another.

Vegetable Preparation

Ensure that heat generated by the cooking equipment does not flow into the cooled vegetable areas, which will result in an unsanitary storage environment.

Ensure that the kitchen exhaust hood ventilation system is properly engineered to avoid heat buildup.

Bakery

Provide a separate space for the bakery in a 1000 person dining hall. Provide surfaces and finishes in this room that are non-porous and easily maintained. Consult FDA standards.

Ice Machines

Provide equipment to produce both cubed and flaked ice. Air Force dining facilities require approximately one pound of ice per customer per day. Cubed ice is suitable for most uses, but flaked ice is required for the salad bar.

Locate the ice machine in the coolest portion of the kitchen to maximize efficiency. Use remote condensers if practicable. If not, ensure that the exhaust of one condenser does not become the supply air for the next. Consider a water-cooled system wherever there is an ample, inexpensive water supply.

Key Issues

- Ensure knobs and controls on equipment are recessed.
- Ensure all production areas are visible and accessible from a central point.
- Install automatic lift baskets and/or timers on deep fat fryers.
- Use remote condensers or water-cooled refrigeration systems for ice machines and walk-in cooler/freezer.
- Locate work tables and hand sinks with soap and towel dispensers near all food handling areas to improve food preparation efficiency.



Arrange cooking equipment so it can all be easily seen.

CLIPPER (SCULLERY) AREA ■

Design the room to segregate clean and dirty dishes. The clipper room's main feature is a large rack-type dishwasher. Traffic through the clipper room is heaviest in the kitchen. Good planning of this room is essential to its efficient operation.

Use a condensate exhaust canopy above the dishwasher in lieu of the conventional vent stacks for more effective steam removal. The vent stacks supplied with dishwashers usually are not sufficient to remove all of the steam.

Ensure the air conditioning system is designed to handle the latent heat load caused by the dampness.

Select a clipper room ceiling finish that will stand up to moisture and can be easily replaced. Consult FDA standards.

Leave a minimum of two feet clearance on all sides of the dishwasher so that service personnel have access to all parts of the machine.

Provide for a high pressure mobile cleaning machine. This machine is used to clean greasy cooking equipment. The clipper room is an ideal location to store and use the high pressure mobile cleaner, provided the wall finish is non-porous and washable.

Key Issues

- Install the dishwasher with at least two feet of clearance on all sides.
- Consider a condensate exhaust hood over the dishwasher in lieu of vent stacks.
- Ensure adequate cooling and ventilation.
- Design the flow of dishes through the room to prevent contamination of clean dishes by soiled dishes.
- Use heat and steam resistant materials on walls and ceilings.
- Install a mobile, high-pressure cleaning machine in the clipper room.
- Locate the clipper room to be convenient to both the serving line and the dining area for a good flow of clean and dirty dishes and flatware.



Locate the dishwasher for easy access to all machine parts.



Typical dishwasher.

■ STORAGE AREAS



Refrigerated storage areas constructed from aluminum.

Size storage to accommodate several days worth of supplies. These spaces include refrigerated and non-refrigerated rooms which can be access controlled or uncontrolled.

Controlled Storage

Consumable food items are kept in a storage area controlled by a stock clerk. Because access to the storage area is limited, the stock clerk can closely monitor deliveries and issues. By logging these transactions into the Services Information Management System (SIMS), the clerk provides reliable food usage and inventory totals.

Provide a controlled refrigerated storage area that consists of walk-in storage divided into a low temperature freezer box, a thaw box, a dairy box, a cook's box, and a vegetable box.

Install a bumper rail on all exposed equipment panels, kick plates on doors, and on the loading dock side of the refrigerated area to prevent collision damage.



Special racks for storage of soda syrup CO₂ and tanks.

Provide non-refrigerated storage space for items such as canned goods, rice, flour, spices, oils, and soda tanks.

Although refrigeration of this area is not required, provide climate control to maintain comfortable working conditions.

Since storage space is often at a premium, provide modular, adjustable shelving .

Provide convenient access to the loading dock. Avoid level changes between the loading dock and kitchen areas.

Locate issue points from food storage areas so that they are easily accessible to the food preparation areas.

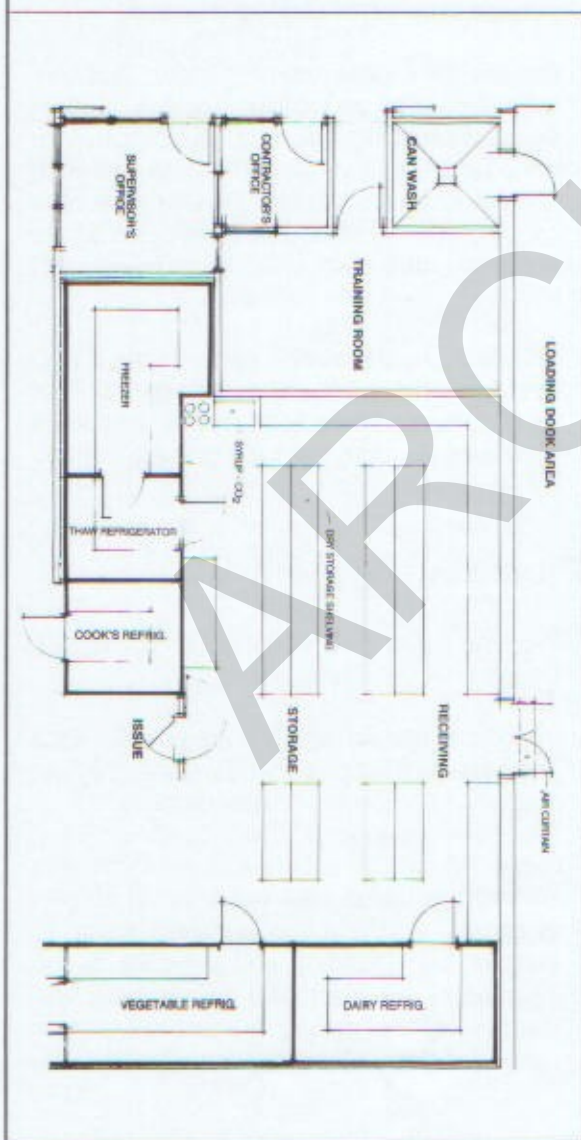
Expendable Storage

Provide expendable, or uncontrolled, storage for non-consumable items that receive frequent use in the kitchen. Smallwares such

Provide space within the storage area for the

Key Issues

- Ensure adequate cooling and humidity control, even in room temperature storage areas.
- Place bumper rails on all walk-in panels.
- Install a kick plate on walk-in doors.
- Install safety approved racks for CO₂ tank storage.
- Install mobile, adjustable shelving for walk-ins and room temperature storage areas.
- Locate soda syrup tanks in the store room, not under the serving counters.



Design the utilities properly because retrofitting them to correct an oversight is expensive. Supporting utility systems contribute to the success or failure of a kitchen's design. Properly designed, the HVAC, plumbing, and electrical systems make the facility comfortable, easy to maintain, and flexible. Improperly designed, they can render the kitchen uncomfortable, prone to breakdowns, and impossibly rigid.

HVAC System

Design the HVAC system to handle not just the overall heat load, but to handle large local heat loads. Since the heat load is not constant throughout the kitchen. The cooking line and



Screen remote condensers.

the bakery generate much more heat than the vegetable preparation area, while the dishwasher produces large amounts of moisture.

Provide a well-balanced exhaust hood ventilation system above all heat and steam producing equipment. Avoid cold air diffusers above hot food zones.

Air removed from the kitchen, especially that from the cooking line, is laden with grease. As a safety precaution, regulations require periodic cleaning of exhaust ductwork.

Provide removable ceiling panels, ductwork access panels, and diffuser grates to allow easy access to all sections of the exhaust ducts since the grease tends to settle in the ductwork, and creates a fire hazard. Provide an access panel after every 90 degree bend in the duct to accommodate regularly scheduled duct cleaning.

Ensure a proper balance between the HVAC system and kitchen cooking exhaust ventilators to prevent heat, smoke, and odors from escaping into the food preparation and serving areas.

Plumbing System

Provide oversized drain lines to mitigate clogging.

Provide a system which automatically adds degreaser to the pipes upstream of all the floor drains to help prevent grease clogs.

Design the water supply system to provide sufficient hot and cold water to all kitchen locations. Provide for softened water to improve the efficiency and reliability of the equipment. Ice machines, dishwashers, and steam equipment are all prone to lime and scale deposits if they are used with hard water.

Plumb the overflow from the soda dispenser using PVC since iron pipes are especially prone to corrosion by carbonic and citric acids found in soft drinks.

Electrical System

The electrical system is usually designed for the initially installed equipment. However, changes to the kitchen layout occur over the life of the facility often resulting in additional electrical loads.

Provide an excess capacity of twenty percent in the kitchen's electrical design to accommodate modifications over the life of the facility.

Provide additional outlets for both 110 and 220 volt equipment along the serving line.

Locate the load distribution center and circuit breakers away from the cooking area. The damp air, grease, and water prevalent on the line cause early failure of circuit breakers.

Key Issues

- Install self-cleaning ventilation hoods with adequate capacity above all heat and steam producing equipment.
- Provide electrical capacity 20% in excess of what is required for the originally installed equipment.
- Ensure exhaust ductwork is accessible and easy to clean.
- Do not install cold air diffusers above hot food zones.
- Install a water softening system to treat water with high mineral content, especially for water used in steam and cleaning equipment.

- Install the grease trap for easy access by trucks behind and away from the customer entrance to the dining hall.
- Install oversized floor drain pipes.
- Use PVC pipe for plumbing the overflow drain from the soda dispenser.
- Ensure adequate ventilation in the pot and pan washing area, which has open sinks full of 180 degree water.
- Locate the circuit breakers away from wet or greasy cooking environment.
- Install easy connections for emergency generators.

■ INTERIOR FINISHES

Floor Finishes

Use quarry tile for spaces such as the food storage, preparation, and serving areas and the clipper area. Select either an abrasive quarry tile or one treated with acids to be rendered slip resistant. Use mildew resistant grout. Consult FDA standards.

Use slip resistant ceramic tiles for higher traffic areas such as restrooms for kitchen staff and patrons.

Wall Finishes

Use glazed CMU in food storage and preparation areas and clipper area.

Use moisture resistant drywall only in areas of low humidity and small temperature fluctuations, such as restrooms.

Specify cart rails and corner guards for all kitchen walls to prevent damage from rolling carts and mobile cooking equipment.

Ceiling Finishes

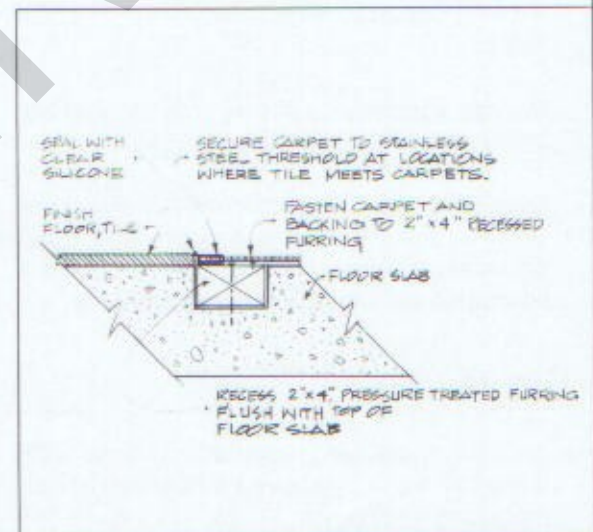
Use drop-in ceiling panel systems in all areas. Use acoustic ceiling panels in office areas or training rooms where sound absorption is desired.

Consult USDA standards to select a more durable panel with sanitary qualities for food storage and preparation areas which are not subject to high humidity or temperature fluctuations.

Use a metal panel systems for high humidity and temperature locations in the food preparation and clipper areas

Key Issues

- Quarry and ceramic tiles should be decorative as well as non-skid.
- Specify a floor grout that doesn't absorb water.
- There are very few places in a kitchen that are suitable for carpeted floors. Carpet might be selected for administrative offices and training rooms, but it must be very durable.



- Never use wall tile smaller than 4" x 4" in any area with cart traffic.
- Glazed CMU's should be used in hot, humid kitchen environments.
- Never use PVC joints for any wall panels near grills, ovens, or stoves.
- Install cart rails and corner guards on all walls exposed to cart traffic.
- Never use PVC joints for ceiling panels above the grills, ovens, or stores.
- The materials must be sturdy and durable.
- Conditions such as excessive heat or humidity will affect finish durability.
- Specify materials that are easy to clean.
- The interior finish is to be attractive and consistent with the chosen layout and decor.

Specify cart rails and corner guards for all kitchen walls.



SUMMARY NOTES

A/E Notes

The information contained in this guide does not lessen the Architect-Engineer's responsibility for the determining food service facility requirements and satisfying them with construction documents that meet all applicable Federal, state and local codes.

Equipment Specifications

In order to ensure compatibility and to minimize maintenance requirements specify equipment from the smallest possible pool of manufacturers.

Limit the list to six manufacturers or less for the following production equipment:

Dishwasher
Refrigerator Display Cases
Grills
Charbroilers
Steam Kettles
Combination Ovens
Convection Ovens
Stack Ovens
Sandwich Units
Braising Pans
Deep Fat Fryers
Pass through Refrigerators
Pass through Warming Cabinets
Hot Food Wells
Ranges
Vegetable Choppers
Mixers
Reach-in Refrigerators
Potato Peelers
Slicers

Equipment Notes

Equipment maintenance can be performed by either in-house or contractor personnel. The success of either method of maintenance is

linked to the ability of the equipment manufacturers to provide spare parts and the ability of the craftsmen to anticipate any component failures and keep the correct replacement parts in stock. Limiting the number of equipment greatly improves the ability of the maintenance personnel to stock spare parts and perform preventive maintenance on the kitchen equipment at a given installation.

Utilities Requirements

Coordinate equipment requirements with mechanical, plumbing, and electrical specifications. Do not design an unnecessarily complicated electrical system.

Supply sufficient power to the food service areas to match the equipment requirements plus 20 percent excess capacity.

Provide adequate electrical outlets for powering buffers and mobile equipment.

Drainage

Design the floor drainage system so that all floors are properly sloped to floor drain locations. Mobile equipment cannot be located on these sloped floors.

Do not connect drain lines for the floor drains directly to water closet drain lines.

Finishes

Protect walls from mobile equipment with cart rails and corner guards. Ensure equipment has cart bumpers and recessed handles to minimize damage from rolling carts.

Select durable, easily maintainable materials and finishes but avoid an "institutional" interior design.

Design/Construction Notes

Specify the utilities to match the equipment provided as part of the construction documents. In addition, install the ductwork and access panels as designed. The construction management team should also ensure that all mobile equipment has vertical and horizontal bumpers to protect building surfaces from damage while in service.

Carefully examine deviations from the design before accepting substitutions.

Ensure that equipment clearances are maintained to provide for easy access for later maintenance, repair, and cleaning.

Coordinate the critical dimensions of the food service areas with the size of food service equipment. Closely review the equipment submittals for compliance with the specifications.

Check access panel clearances and inspect any field modifications carefully to ensure they do not impact the operability or maintainability of the equipment.

Contacts

	DSN
HQ ACC/MWFF Facilities & Resource Branch	574-3106
HQ ACC/MWPC Food Service Section	574-2617
CETSO/ESED-A Civil Engineering Technical Support Office - Design Branch	1-800-435-7834 Ext 4307
HQ AFMWRSA/MWXF Facilities & Logistics Division	487-2587

References

ACCR 88-1, Exterior Signs

ACCR 88-3, Design and Construction Policy for ACC Facilities

AFR 146-7, Food Service Management

AFM 86-2, Standard Facility Requirements

Mobile kitchen equipment can damage walls without rails.



■ FLIGHT KITCHENS

The flight kitchens provide fast-food style takeout meals and box lunches. There are two basic types of flight kitchens, the attached flight kitchen (AFK) and the remote expanded flight kitchen (EFK).

The AFK is attached to the main dining facility and is completely dependent upon the dining hall for storage, production, and maintenance facilities. The EFK is self-contained and located near the flight line.

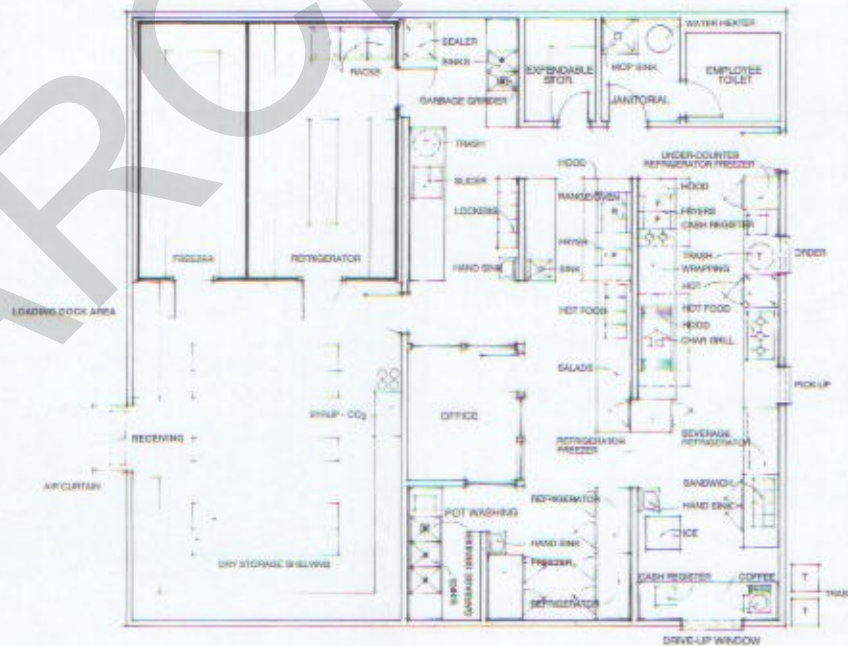
Provide overhead and undercounter storage for supplies to reduce movement to retrieve condiments, buns and paper goods.

Because the flight kitchens are small, storage space often presents a significant problem.

Provide sufficient cold storage to supply at least one shift's production needs to avoid time-consuming restocking during the mealtime rush.

Key Issues

- Provide an intercom system to allow the cashier to communicate with the cooks.
- Provide enough on-line cold storage for one shift's operation.
- Provide overhead and undercounter storage of prepared food/supplies.
- Provide enough off-line storage capacity for four days of production.



PROTOTYPICAL EXPANDED FLIGHT KITCHEN LAYOUT





John L. Hennessy Trophy

The John L. Hennessy Trophy is presented to the Air Force installation having the best food service program in the United States Air Force. The tools of success include astute management, command support of food service operations, well maintained facilities, and the attitude on behalf of the best to excel and become a winner.