

## **SECTION 6 - EQUIPMENT AND INSTALLATION**

All equipment in food establishments shall be NSF (National Sanitation Foundation), UL Sanitation, ETL Sanitation or equivalent, and shall be designed, constructed and installed in conformance with the requirements of NSF standards.

Equipment shall not be located under exposed or unprotected sewer lines, open stairwells or other sources of contamination.

Equipment should be installed in accordance with the NSF "Manual On Sanitation Aspects Of Installation Of Food Service Equipment" or equivalent .

The following outlines some of the equipment installation requirements to insure proper spacing and sealing to allow for adequate and easy cleaning:

Food equipment shall be installed as follows:

1. Counter-mounted equipment shall be on 4-inch sanitary legs, sealed to the counter or be portable.
2. Floor-mounted equipment shall be on 6-inch sanitary legs, on casters, or sealed to the floor.
3. Equipment not on casters or not portable shall be sealed to the wall and/or adjoining equipment, or spaced to facilitate cleaning.
4. Portable equipment and equipment installed on casters shall be installed with flexible utility lines and/or quick-disconnect couplings.

The above criteria shall be applied to permit all exposed areas of equipment and adjacent surfaces to be accessible for cleaning. If an item of equipment is not portable, is not installed on casters, or is not otherwise easily moved, it shall be (1) sealed to adjoining surfaces with an approved sealant or metal flashing, or (2) provided with sufficient space between and behind the equipment to allow easy access.

### **Installation Requirements for Dishwashing Equipment**

Install dishwashing equipment and drainboards a minimum of 3 inches from any adjacent wall area. Drainboards may be manufactured with continuous side and back splashes and mounted directly to the adjoining wall area.

Backsplashes must adjoin the wall within 1/32 of an inch and be caulked and sealed to create a smooth, sanitary, vermin proof installation. Where equipment does not effectively adjoin the wall within 1/32 of an inch it should be installed a minimum of 3 inches off the wall.

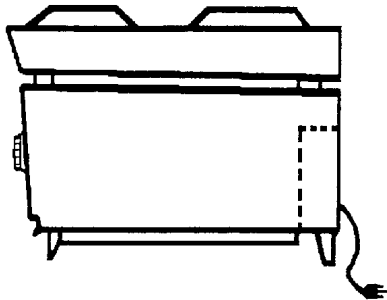
Soiled Drainboards are recommended to be located a minimum of 18" from food contact surfaces or equipped with splash protection.

Splashguard protection is required if spacing to adjoining food, food contact surfaces, or utensil washing and storage area surfaces are less than 18 inches. Splashguards shall not hinder access to the lavatory, should extend from the front of the sink to 12 inches above the rim of the sink, and be of easily cleanable construction.

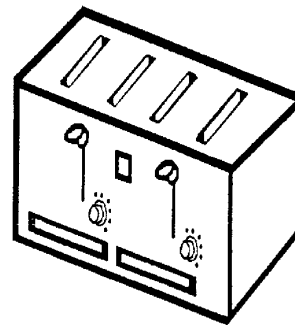
## **Portable Equipment**

Food equipment that is small and light enough to be easily moved by one person shall be considered portable and is exempt from equipment installation requirements.

(Figure 3 illustrates some examples of portable equipment. The hot plate and toaster are both equipped with an electrical connection that can be disconnected.)



**Electric Hot Plate**



**Toaster**

**FIGURE 3.**

## **Counter Installation of Equipment**

Food equipment, which is not readily movable because of size, weight, or rigid utility connections, shall be installed on counters or tables as follows:

1. On 4-inch sanitary legs; or
2. Sealed to the counter; and
3. Properly spaced to facilitate cleaning; or
4. Equipped with an integral lift lever, pivoting foot, polyethylene wear strips, or a similar device, which allows easy access under and around the equipment for cleaning.

## **Undercounter Installation of Equipment**

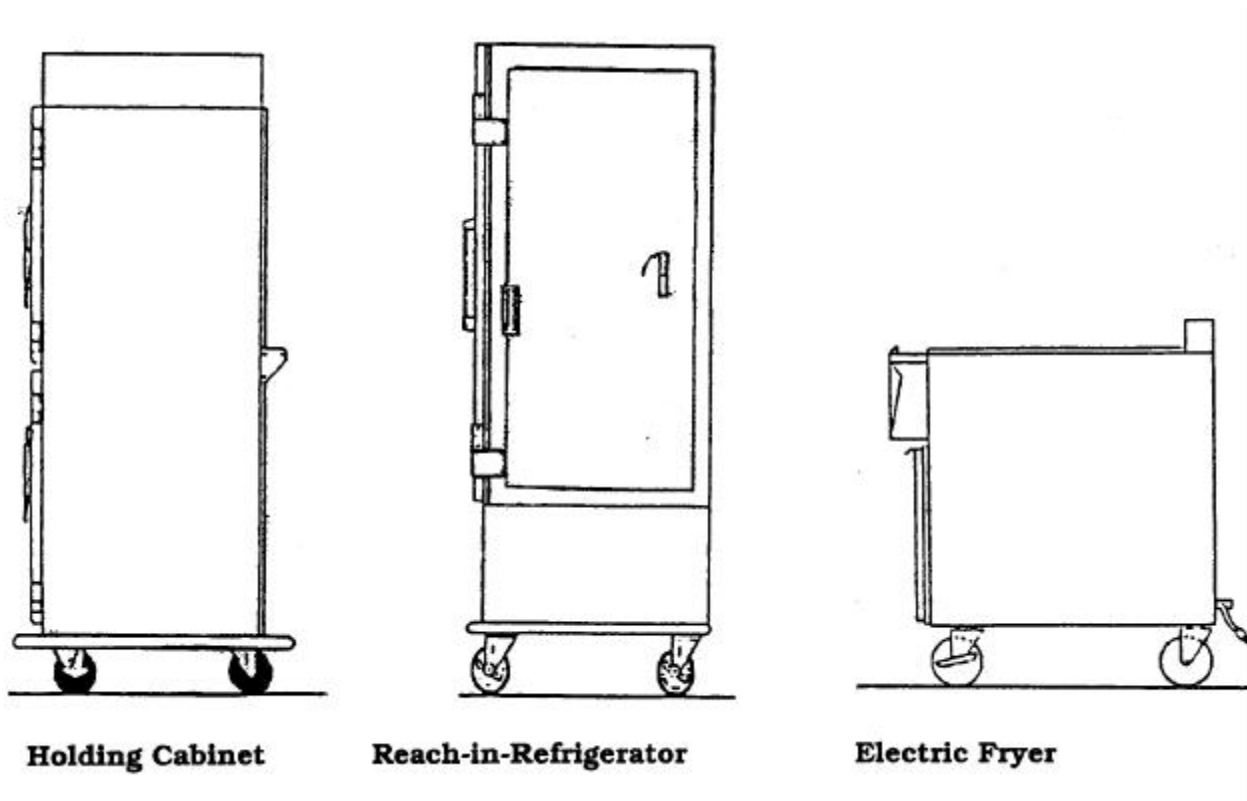
Undercounter equipment installed on the floor shall be equipped with casters or sanitary skids, or on 6-inch sanitary legs and sealed to adjacent surfaces or properly spaced to facilitate cleaning.

## **Casters**

Casters shall be properly sized for the equipment served, and should be compatible with the cleaning materials used. It is strongly recommended that equipment be installed on casters when possible. Equipment installed on casters allows easy movement and facilitates the cleaning of surrounding surfaces and equipment. Casters also allow for maximum utilization of space by reducing or eliminating spacing requirements for cleaning.

Casters can be installed on most food equipment, including ice machines and deck ovens. Flexible or quick-disconnect couplings are needed on caster-mounted equipment with utility connections. Due to safety concerns, some tilting braising pans, equipment receiving direct steam lines, and some top-heavy equipment should not be installed on casters. Casters may not be the appropriate when floors are severely degraded.

**(Figure 4 illustrates equipment on casters.)**



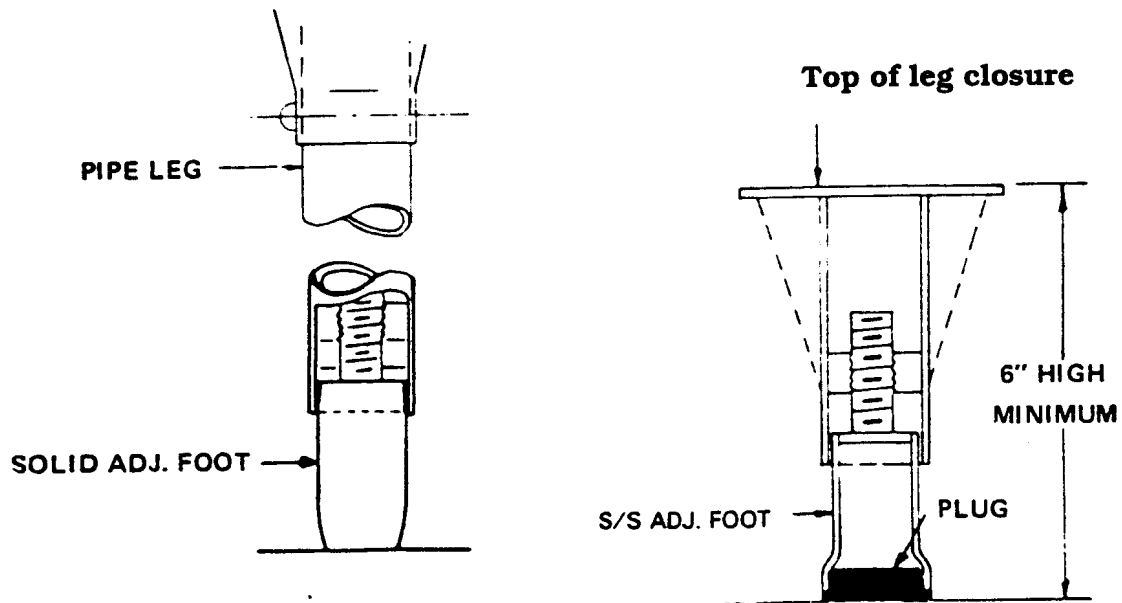
**Figure #4**

## **Sanitary Legs**

When equipment is supported on legs and installed on the floor, the legs shall:

1. Provide at least six inches of unobstructed space between the equipment and the floor;
2. Be of a design that is easily cleanable and constructed of approved materials; (Angle iron, bricks, and concrete blocks are not approved)
3. Be arranged and built to prevent internal harborage of vermin or accumulation of liquids and debris;
4. Provide a minimum of interference with cleaning at the leg-floor contact,
5. Contain no exposed threads, or embellishments, or overhanging edges that serve as places for accumulation of dust, dirt, and debris.

(Figure 5 illustrates equipment with Sanitary Legs.)



**FIGURE 5.**

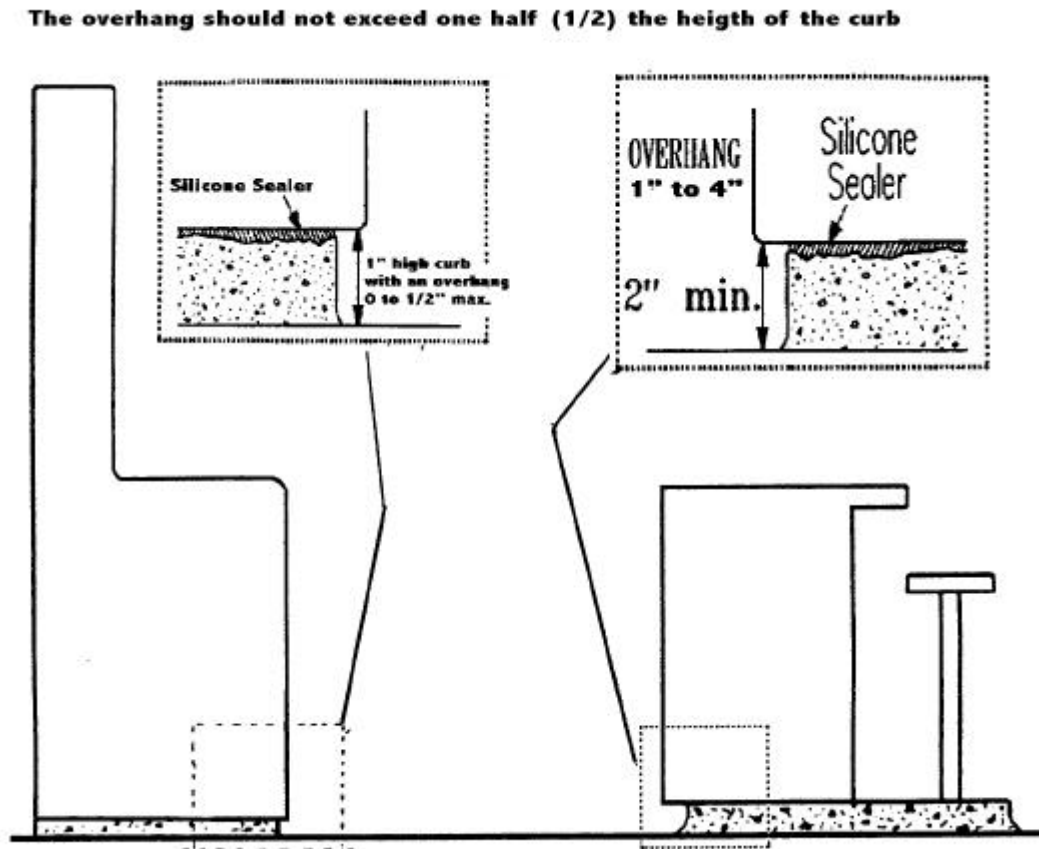
**It is desirable for the legs to be adjustable.**

## Masonry Islands

Island installation of equipment reduces the total floor area that must be cleaned. Masonry islands should be a minimum height of six inches with a cove of at least 1/4" inch radius at the juncture of the island and the floor. The edges of the equipment should overhang the island (but not more than the height of the island) to prevent grease or other liquids which may spill over or run down the sides from running underneath. The juncture between the base of the equipment and the island shall be sealed to prevent vermin harborage.

Remember to plan for a of 30 inches minimum and 36 inches preferred for a single aisle, 48 inches minimum and 60 inches preferred for a double aisle.

(Figure 6 illustrates a single aisle curb based installation.)

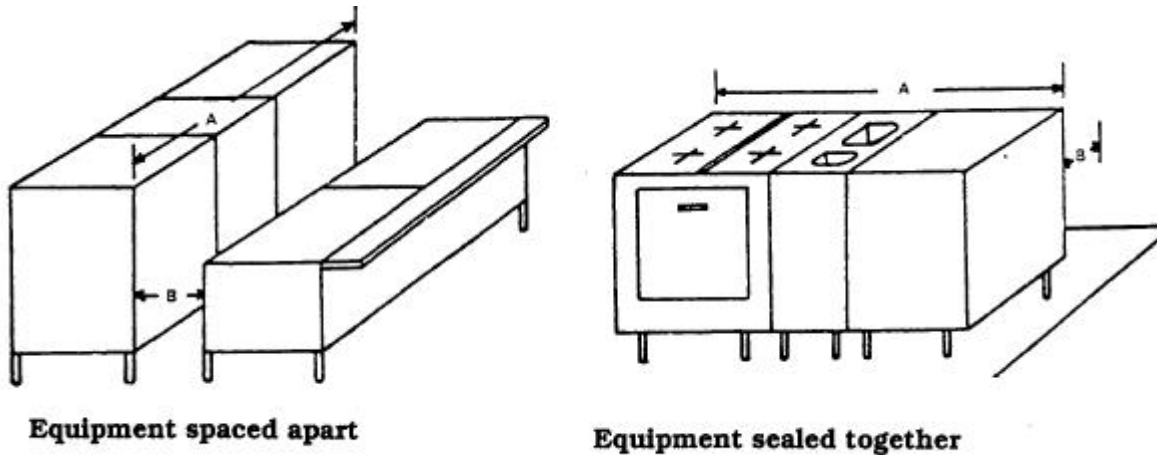


**FIGURE 6.**

## **Spacing Requirements for Food Equipment**

Equipment not readily movable or sealed to adjacent surfaces shall be spaced to allow access for cleaning. The amount of space required between and behind equipment depends on the size of the equipment and the accessibility needed for cleaning the equipment and adjacent surfaces.

(Minimum space requirements for food equipment installation are as illustrated in figure 7.)



**FIGURE 7.**

1. Provided access is available from both ends of the equipment and the total equipment length is four feet or less (A), the equipment shall be spaced at least six inches from walls and other equipment (B).
2. Provided access is available from both ends of the equipment and the total equipment length is over four feet but less than eight feet (A), the equipment shall be spaced at least 12 inches from walls and other equipment (B).
3. When the total equipment length is eight feet or more (A), the equipment shall be spaced at least 18 inches from walls and other equipment (B).
4. A minimum of six inches of space shall be provided between items of equipment to allow access for cleaning. Additional space may be required for large equipment when six inches is not adequate to provide access.
5. Obstruction of the access opening between and/or behind equipment by a chase or rigid utility connection may require additional spacing.

## **Floor Attachment of Equipment**

Equipment placed directly on the floor, such as counters, display cases, cabinets, proofers, ovens, large cooking kettles and retarders shall be effectively sealed to the floor using silicone, metal flashing, vinyl covered base, or other approved material. Metal kick plates which are readily removable will not be required to be sealed to the floor, provided the base of the equipment is sealed to the floor or the areas behind the kick plates are easily cleanable.

**(Figure 8 illustrates floor-mounted equipment.)**



**Cooking Kettle**



**Bakers Oven**

**FIGURE 8**

## **Wall Attachment of Equipment**

Equipment attached to walls, such as lavatories, preparation sinks, utensil washing sinks, dish tables, counters, and cabinets shall be effectively sealed to the wall to prevent splash, debris accumulation, and vermin harborage. Note: any combination of low profile or pan head bolts, screws, rivets, silicone sealers, or flashing that effectively closes the opening between the equipment and the walls in a smooth and sanitary manner is acceptable.

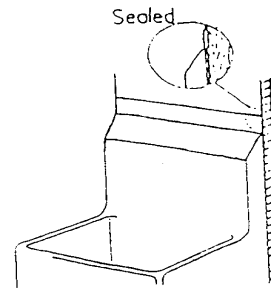
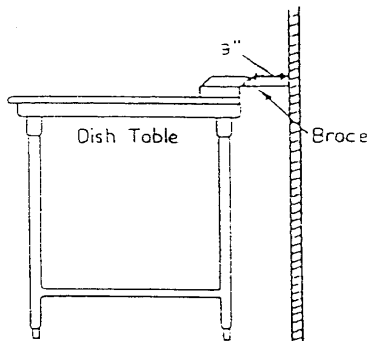
If the equipment is open underneath, such as a drainboard, dish table, or open base table, it may be installed at least three inches away from the wall. This provision is made due to the fact that dish tables, drainboards, and immobile open base tables are accessible underneath the counter top and a space of three inches from the wall to the equipment is enough to facilitate cleaning.

(Figure 9 illustrates both of these installations.)

**Table**

**Hand Sink**

**FIGURE 9.**



### **Free Standing Attachment**

Utensil wash sinks, prep sinks or any sink that requires water to the unit can be either mounted to the wall or off the wall. The equipment can also be installed free standing (not attached or bracketed off) if the equipment is installed with flexible water lines that allow for the unit to be pulled 6 to 12 inches away from the wall for cleaning. This method will allow for easier installation and will prevent the problem of having to replace the sealant on a wall attached unit approximately every year. **(Figure 10 illustrates this installation.)**

### **Sink with flexible water lines and wasted indirectly to a floor sink**



**Figure 10**

In cases where the space between the equipment and the wall is too large for use of a silicone sealant, metal or other approved flashing is necessary for an effective seal. Examples of equipment that frequently require metal flashing are walk-in coolers and freezers, retarders, proofers, and large ovens. Some installations may require a combination of flashing and silicone sealant.

Equipment mounted on legs and placed against walls and which can be readily moved for cleaning will not be required to be sealed to adjacent surfaces (i.e. work tables and some equipment tables).

### **Exposed Utility Lines**

Utility service lines and pipes shall not be unnecessarily exposed on walls or ceilings, in walk-in refrigeration units, food preparation areas, equipment washing areas, utensil washing areas, toilet rooms, and vestibules. Exposed utility service lines and pipes shall be installed in a way that does not obstruct or prevent cleaning of the floors, walls, and ceilings. Installation of exposed horizontal utility lines and pipes on the floor is prohibited. Installation of exposed utility line and pipes for service to equipment up to point of attachment should be 6 inches above the floor and 1 inch off the wall.

The North Carolina Electrical Code prohibits placement of equipment within 36 inches in front of the electrical panel. It is desirable that switch boxes electrical control panels, wall mounted electrical cabinets, and etc. is installed out of the cooking or dishwashing areas. Consult with you local electrical inspector for more details.

All utility and service lines and openings through the floor must be sealed adequately. Exposed vertical and horizontal pipes and lines must be kept to a minimum. The installation of exposed horizontal utility lines and pipes on the floor is prohibited. Any insulation material used on utility pipes or lines in the food preparation or dishwashing area must be smooth non-absorbent and easy to clean.

## **Sneeze Guard Installation**

1. Sneeze Guards (food Shields): Display of unpackaged foods shall be effectively shielded to intercept the direct line between the customer's mouth and the display of food, and shall be designed to minimize contamination by the customer.
2. Shields shall be mounted to intercept a direct line between the customer's mouth and the food display area at the customer –use- position. The vertical distance from the average customer's mouth to the floor shall be considered (1.4 m) 4 ft 6 in to (1.5 m) 5 ft. Special consideration must be given to the average customer's mouth height in educational facilities and other special installations.
3. Shields shall be fabricated of easy-to-clean and sanitary material.
4. Edges of glass or other hazardous material shall be trimmed with a smooth protective member or have a safety edge of parent material.
5. Where the ends of equipment are designed to allow for customer self service, or customer view food shields complying with these standards shall be installed.

**See Appendix A - 6 Sneeze Guard Design And Installation For Elementary, Middle, High School And For Commercial Food Service Establishments.**