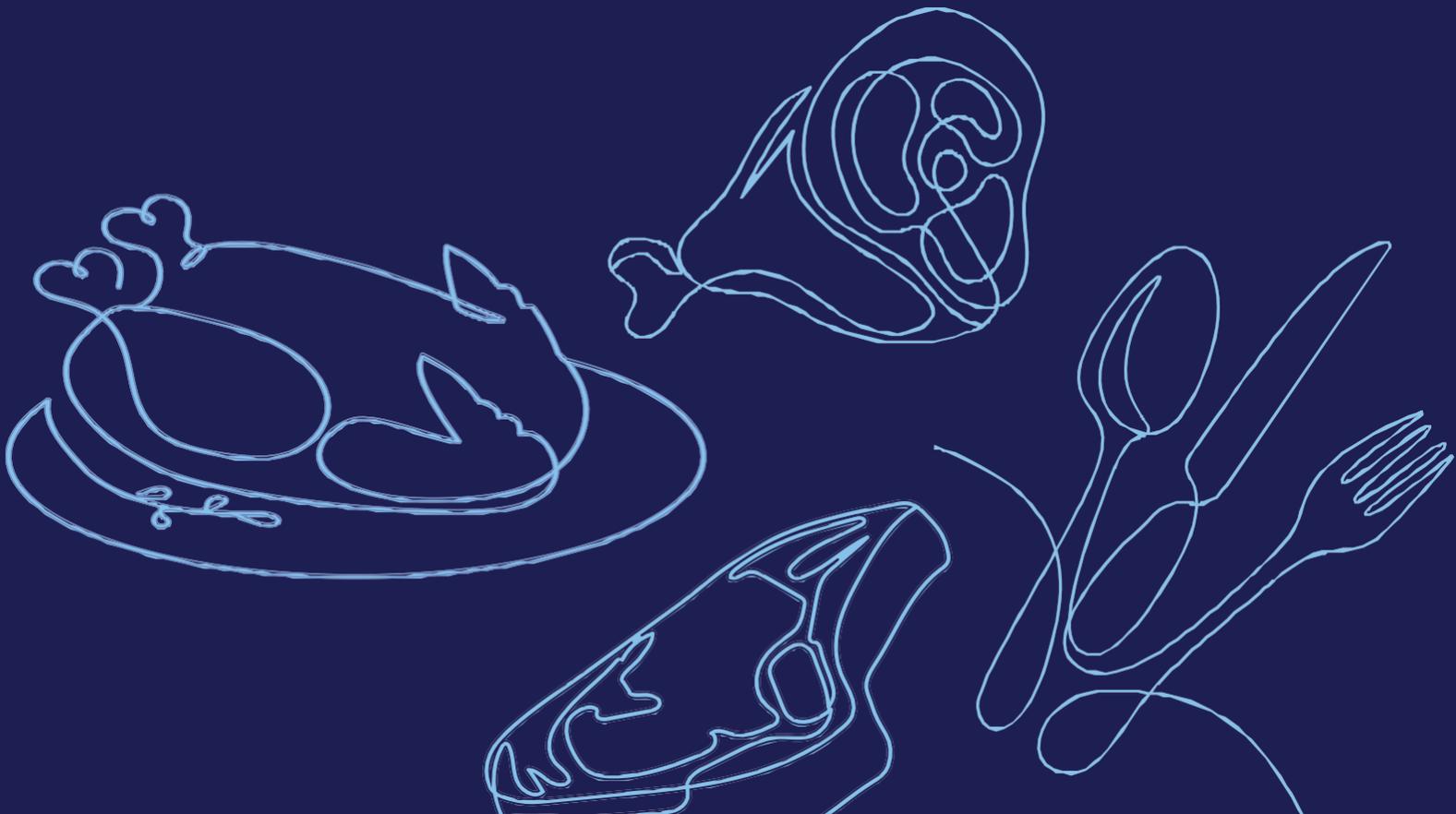




Meat
Foundation

Facility Design Principles



Checklist Scoring

- **S = Satisfactory** | **Full Points:** Usable as is without changes or alternate procedures to meet the expectation.
- **M = Marginal** | **Half Points:** Does not meet the expectation, but can be overcome through alternate procedures. May be an opportunity for improvement through redesign.
- **U = Unsatisfactory** | **Zero Points:** Does not meet the expectation and cannot be overcome through alternate procedures. May require redesign.
- **NA = Not applicable** | Remove points from total

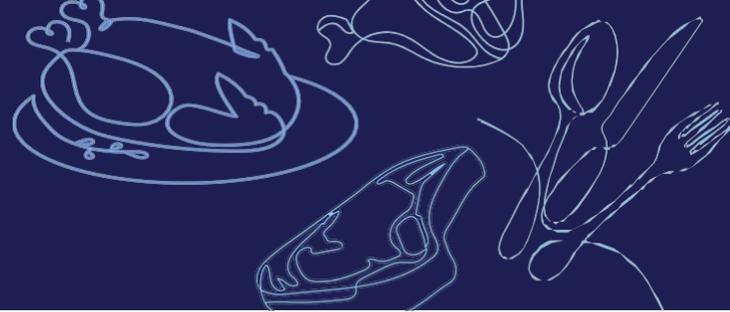
Recommended Citation

Facility Design Principles (ed.). 2015. Facility Design Principles: checklist. Meat Institute and Meat Foundation, Arlington, VA



Nourishing Today
Sustaining Tomorrow

Facility Sanitary Design Checklist



PRINCIPLE #1 – DISTINCT HYGIENIC ZONES ESTABLISHED IN THE FACILITY

Maintain strict physical separations that reduce the likelihood of transfer of hazards from one area of the plant, or from one process, to another area of the plant, or process, respectively. Facilitate necessary storage and management of equipment, waste, and temporary clothing to reduce the likelihood of transfer of hazards.

#	CRITERIA	S, M, U, NA	COMMENTS	POINTS	POINTS AVAILABLE
1.1	Facility drawings show hygienic zones				10
1.2	Physical barriers prevent uncontrolled movement between RTE/high risk & non-RTE/lower risk zones				10
1.3	Vestibules are designed to break contamination at entry to RTE/high risk zones				10
1.4	Separate locker rooms exist for RTE/high risk & non-RTE/lower risk personnel				10
1.5	Separate break rooms & lunch rooms exist for RTE/high risk & non-RTE/lower risk personnel				10
1.6	Restroom facilities are located away from RTE/high risk zones				10
1.7	Separate storage areas for tools & spare parts exist to minimize contamination for RTE/high risk & non-RTE/lower risk zones				10
1.8	Separate QA labs exist for RTE/high risk & non-RTE/lower risk zones				10
1.9	Separate sample storage areas exist for RTE/high risk & non-RTE/lower risk zones				10
1.10	Separate support & storage areas for sanitation crews exist for RTE/high risk & non-RTE/lower risk zones				10
1.11	Space is provided for clean equipment storage				10
1.12	Soiled laundry collection methods are established				10
1.13	Space is provided for boot storage & cleaning				10
1.14	Temporary smock storage is provided during breaks				10
1.15	Trash collection is properly located, & locations are cleanable & maintainable				10
1.16	Condemned storage is identified clearly				10
1.17	Color codes (e.g., garments, helmets) are used to identify hygiene zones				10
				SCORE:	170

PRINCIPLE #2 – PERSONNEL & MATERIAL FLOWS REDUCE HAZARDS

Establish traffic and process flows that control movement of production workers, managers, visitors, QA staff, sanitation and maintenance personnel, products, ingredients, rework, and packaging materials to reduce food safety risks.

#	CRITERIA	S, M, U, NA	COMMENTS	POINTS	POINTS AVAILABLE
2.1	Movement of employees throughout the facility is controlled				10
2.2	Movement of visitors throughout the facility is controlled				10
2.3	Movement of contractors throughout the facility is controlled				10
2.4	Movement of maintenance personnel throughout the facility is controlled				10
2.5	Systems are in place for sanitary transportation of packaging materials into RTE/high risk zones				10
2.6	Systems are in place for sanitary transportation of ingredients into RTE/high risk zones				10
2.7	Systems are in place for sanitary transportation of rework into RTE/high risk zones				10
2.8	Systems are in place for sanitary removal of trash from RTE/high risk zones				10
SCORE:					80

PRINCIPLE #3 – CONTROL WATER ACCUMULATION INSIDE FACILITY

Design and construct a building system (floors, walls, ceilings, and, supporting infrastructure) that prevents the development and accumulation of water. Ensure that all water positively drains from the process area and that these areas will dry during the allotted time frames.

#	CRITERIA	S	COMMENTS	POINTS	POINTS AVAILABLE
3.1	Floor design & drainage systems prevent standing water				10
3.2	All floor joints & cracks are sealed				10
3.3	Wall & curb surfaces drain freely without pockets, ledges & nooks				10
3.4	Areas above ceilings do not accumulate water				10
3.5	Equipment wastewater discharges are piped directly to drains				10
3.6	Drain pans are sloped to be free draining				10
SCORE:					60

PRINCIPLE #4 – CONTROL ROOM TEMPERATURE & HUMIDITY

Control room temperature and humidity to facilitate control of microbial growth. Keeping process areas cold and dry will reduce the likelihood of growth of potential food borne pathogens. Ensure that the HVAC/refrigeration systems serving process areas will maintain specified room temperatures and control room air dew point to prevent condensation. Ensure that control systems include a cleanup purge cycle (heated air make-up and exhaust) to manage fog during sanitation and to dry out the room after sanitation.

#	CRITERIA	S, M, U, NA	COMMENTS	POINTS	POINTS AVAILABLE
4.1	Room temperature meets process requirements				10
4.2	Dew point is controlled to prevent condensation				10
4.3	Room air-handling system has a cleanup mode with sufficient air changes to remove fog & to dry out the room after sanitation				10
4.4	Refrigeration system has the capacity to meet process requirements				10
SCORE:					40

PRINCIPLE #5 – CONTROL ROOM AIR FLOW & ROOM AIR QUALITY

Design, install and maintain HVAC/refrigeration systems serving process areas to ensure air flow will be from more clean to less clean areas, adequately filter air to control contaminants, provide outdoor makeup air to maintain specified airflow, minimize condensation on exposed surfaces, and capture high concentrations of heat, moisture and particulates at their source.

#	CRITERIA	S, M, U, NA	COMMENTS	POINTS	POINTS AVAILABLE
5.1	All rooms have their pressures controlled to ensure the airflow will be from more clean to less clean areas				10
5.2	Critical process air is adequately filtered				10
5.3	Outdoor makeup air is sufficient to maintain specified pressurization				10
5.4	Air handling system components meet the 10 Principles of Equipment Sanitary Design				10
5.5	Provision is made to capture high concentrations of heat, moisture & particulates at the source				10
5.6	HVAC/refrigeration system components are located to avoid risks of product contamination				10
5.7	Drain pans & distribution plenums are heated to prevent condensation on exposed surfaces				10
5.8	HVAC/refrigeration systems are dedicated appropriately to specific control zones to prevent cross-contamination				10
SCORE:					80

PRINCIPLE #6 – SITE ELEMENTS FACILITATE SANITARY CONDITION

Provide site elements such as exterior grounds, lighting, grading, and water management systems to facilitate sanitary conditions for the site. Control access to and from the site.

#	CRITERIA	S, M, U, NA	COMMENTS	POINTS	POINTS AVAILABLE
6.1	Driveways, parking lots & pedestrian walkways are paved & drain to prevent standing water				8
6.2	Landscaping & grounds are designed to minimize attraction & harborage of insects & rodents				8
6.3	Adequate trash receptacles in pedestrian traffic areas are provided				10
6.4	Insect attractant lighting is positioned to draw insects away from the building				10
6.5	Grading provides positive drainage away from building				10
6.6	Finished floor elevation is higher than adjacent grades to prevent storm water ingress into building				10
6.7	External operations (e.g., trailer cleaning, bulk storage, trash & waste management) are designed & positioned to prevent unsanitary impact on the facility				10
6.8	Storm water system is properly designed & maintained to prevent standing water on the site				10
6.9	Detention & retention basins are properly designed, maintained & operating				8
6.10	Process drains exist to prevent biomass, chemicals or other non-storm water wastes from entering the storm water system				10
6.11	Truck docks have positive drainage				9
6.12	A minimum of 18" of asphalt, gravel or concrete borders are present on all exterior sides of the facility				8
SCORE:					111

PRINCIPLE #7 – ENVELOPE DESIGNS FACILITATE SANITARY CONDITIONS

Design and construct all openings in the building envelope (doors, louvers, fans, and utility penetrations) so that insects and rodents have no harborage around the building perimeter, easy route into the facility, or harborage inside the building. Design and construct envelope components to enable easy cleaning and inspection.

#	CRITERIA	S, M, U, NA	COMMENTS	POINTS	POINTS AVAILABLE
7.1	Building envelope (i.e., shell, skin) is constructed of materials that are solid, impervious, & free of cracks & voids				10
7.2	Roof flashing systems prevent harborage of insects, birds & rodents				10
7.3	Roof is sloped to provide positive drainage				10
7.4	Canopies are totally closed				10
7.5	All louvers, fans, vents & openings have insect screens				10
7.6	Doors are impervious, fully weatherstripped & fit well				10
7.7	All sills are firmly anchored to the slabs & set in full beds of sealant				10
7.8	All voids associated with utility penetrations (e.g., electrical weatherheads, gas mains, sprinkler risers) are fully filled with appropriate materials, then sealed				10
7.9	All concrete wall panels are caulked from roof to footing				10
7.10	Dock doors have a dockseal or shelter				10
7.11	Dock doors & levelers are weatherstripped fully				10
7.12	Dock pits are easily accessible for cleaning & inspection				10
SCORE:					120

PRINCIPLE #8 – INTERIOR SPATIAL DESIGN PROMOTES SANITATION

Provide interior spatial design that enables cleaning, sanitation and maintenance of building components and processing equipment.

#	CRITERIA	S, M, U, NA	COMMENTS	POINTS	POINTS AVAILABLE
8.1	Aisles are wide enough for maintenance, sanitation & materials movement				10
8.2	There is sufficient access to clean building elements (e.g., columns, beams, bracing)				10
8.3	There is sufficient access to clean the wall-floor interface				10
8.4	Stationary equipment is elevated sufficiently to allow cleaning & sanitation underneath the equipment				10
8.5	The layout is coordinated to allow access to clean & inspect overhead elements (e.g., ducts, piping, equipment, lights, diffusers)				10
8.6	The ceilings heights are adequate to control condensation & reduce air velocities impinging the floor				10
8.7	There is sufficient clearance above stationary equipment to allow cleaning				10
8.8	There is a perimeter inspection zone meeting regulatory requirements				10
SCORE:					80

PRINCIPLE #9 – BUILDING COMPONENTS & CONSTRUCTION FACILITATES SANITARY CONDITIONS

Design building components to prevent harborage points, ensuring sealed joints and the absence of voids. Facilitate sanitation by using durable materials and isolating utilities with interstitial spaces and stand offs.

#	CRITERIA	S, M, U, NA	COMMENTS	POINTS	POINTS AVAILABLE
9.1	Interstitial spaces separate process areas from utility services & overhead structural components, & allow for access & cleaning				3
9.2	Suspended ceilings are smooth, cleanable & at a uniform height				3
9.3	Walls are smooth & cleanable with minimal joints & no cavities				3
9.4	All vertical & horizontal wall joints are sealed appropriately				3
9.5	All vertical surface to floor junctions have surfaces that are free of pits, erosion & voids				3
9.6	Concrete surfaces are free of pits, erosions & voids, solid & smooth				3
9.7.0	Stainless steel curbs go the full height to the curb-wall junction				3
9.8.0	FRP facing is factory laminated or foamed-in-place to insulate				3
9.9.0	Cavity & voids are absent in floor, wall & ceiling assemblies				3
9.10	Refrigerated areas have a vapor barrier to prevent migration of moisture into the insulation				3
9.11	Closed cell or encapsulated insulation is used				3
9.12	Exposed structural steel is minimized & galvanized to meet process requirements				3
9.13	Horizontal structural members have no flat surfaces that can accumulate dust or water				3
9.14	All-thread rods are not used & other threaded surfaces are minimized				3
9.15	Control joints are adequate to avoid irregular cracking in floors				3
9.16	Bases of drains are supported to prevent settlement				3
9.17	All cracks, joints & voids are filled with appropriate materials				3
9.18	Caulking is minimized & done in a quality manner				3
9.19	Items attached directly to a building surface have stand-offs				3
9.20	All mezzanine structures over a processing area are waterproof & drain properly				3
9.21	Air curtains are used where doors are open a significant portion of time during operation				3
SCORE:					63

PRINCIPLE #10 – UTILITY SYSTEMS DESIGN PREVENTS CONTAMINATION

Design and install utility systems to prevent the introduction of food safety hazards by providing surfaces that are cleanable to a microbiological level, using appropriate construction materials, providing access for cleaning, inspection and maintenance, preventing water collection points, and preventing niches and harborage points.

#	CRITERIA	S, M, U, NA	COMMENTS	POINTS	POINTS AVAILABLE
10.1	Horizontal piping & conduits are not installed above exposed product or processing equipment				3
10.2	Piping & conduits are located & spaced to facilitate access, cleaning & sanitation				3
10.3	Piping & conduits are routed outside of process areas wherever possible				3
10.4	Utility equipment & components are installed to allow for ease of access & maintenance				3
10.5	Piping is properly insulated to prevent condensation when the surface temperature is expected to be below room dew point				3
10.6	Corrosion-resistant materials are used for all un-insulated piping, components, supports, hangers & conduits				3
10.7	Lockable fasteners are used on hangers & attachments to avoid risk of foreign material contamination				3
10.8	Glass components are used only where necessary, & are properly protected to avoid risk of foreign material contamination				3
10.9	Compressed air is dried to a pressure dewpoint below the lowest ambient temperature to prevent moisture accumulation in air lines				3
10.10	Compressed air intended for direct product contact is filtered to at least a 0.3 micron level				3
10.11	Refrigeration piping & control valves are installed outside of the process area wherever possible				3
10.12	Unit coolers are accessible for cleaning of unit & drain pan				3
10.13	Coil face velocities do not blow water off the coil				3
10.14	Backflow preventers or air gaps prevent cross-contamination of potable water supply				3
10.15	An antimicrobial intervention (e.g., filtration, ozone, UV) is used to treat water coming in contact with ready-to-eat product				3
10.16	Hot water recirculation loops are used to maintain hot water temperatures at points of use				3
10.17	Where required, steam supply system uses boiler treatment chemicals that are approved for use on direct product contact				3
10.18	All openings on bulk ingredient tanks are secure				3
10.19	Bulk ingredient tanks are designed for proper sanitation				3
10.20	Process & sanitary sewers are separated within the building				3
10.21	Raw process & ready-to-eat process sewers are separated				3

PRINCIPLE #10 – UTILITY SYSTEMS DESIGN PREVENTS CONTAMINATION

Design and install utility systems to prevent the introduction of food safety hazards by providing surfaces that are cleanable to a microbiological level, using appropriate construction materials, providing access for cleaning, inspection and maintenance, preventing water collection points, and preventing niches and harborage points.

#	CRITERIA	S, M, U, NA	COMMENTS	POINTS	POINTS AVAILABLE
10.22	Waste & vent lines are routed to not be above product or process equipment				3
10.23	Where possible, cleanouts are installed outside the processing areas				3
10.24	Drains are accessible for cleaning & sanitation				3
10.25	Trench drains are avoided wherever an alternative is possible				3
10.26	Process sewers are made of materials compatible with the temperature & corrosiveness of the waste stream				3
10.27	Where possible, drain lines are run indirectly to remote sumps in critical areas to avoid the use of "P" traps				3
10.28	Interior storm drains in areas where the dewpoint of cold storm drainage may result in condensation are insulated & jacketed				3
10.29	Adequate condensate drain lines are run from HVAC/ refrigeration equipment & are properly discharged to hub or floor drains				3
10.30	Condensate drain lines are insulated & jacketed in areas where surface condensation may form on the piping, & are heated in areas subject to freezing				3
10.31	Floor drains, hub drains & traps are made of corrosion-resistant materials suitable for area of installation (e.g., stainless steel in critical process areas)				3
10.32	Floor drains in process areas have basket strainers				3
10.33	Plumbing fixtures in restrooms are wall-mounted to facilitate cleaning & sanitation				3
10.34	Fixtures in restrooms operate "hands-free" wherever possible				3
10.35	Motors, equipment & other power components are washdown rated				3
10.36	Conduit sealoffs are used wherever conduits pass between spaces of different temperatures				3
10.37	Utility system controls adequately control & monitor system performance, & meet production needs				3
10.38	Lighting meets recommended guidelines for foot candle levels				3
10.39	Lamps are protected with coatings or shatter-resistant lenses				3
10.40	Lighting fixtures in washdown areas are enclosed & gasketed				3
10.41	Lighting fixtures are easily cleanable				3
10.42	Light sources provide for specified minimum color rendition				3
				SCORE:	126

PRINCIPLE #11 – ADEQUATE SANITATION SYSTEMS

Provide proper sanitation systems to eliminate the chemical, physical, and microbiological hazards existing in a food plant environment.

#	CRITERIA	S, M, U, NA	COMMENTS	POINTS	POINTS AVAILABLE
11.1	Water temperature, flow & pressure meets specified requirements at point of use				10
11.2	Location of hose stations are sufficient & hose lengths are long enough to ensure all points are accessible without draping or carrying hoses across process equipment				10
11.3	Cleanup hoses are stored appropriately outside the process area when not in use, or clean up stations are supplied with adequate hose hangars to keep hoses off of floor				10
11.4	Rinse systems are operated at minimum pressures adequate for cleaning to limit overspray & creation of aerosols during use				10
11.5	Adequate hand washing & sanitizing facilities are provided at locations as required to maintain zones of control				10
11.6	Adequate interventions (e.g., foot baths, doorway foamers, boot washers) are provided at locations as required to maintain zones of control				10
11.7	Adequate systems (e.g., COP, CIP, equipment washers) are provided to facilitate proper cleaning & sanitizing of equipment				10
SCORE:					70

11 Principles of Facility Sanitary Design Summary			
Principle	Score	Points Available	Percent (%)
1. Distinct Hygienic Zones Established In The Facility		170	%
2. Personnel & Material Flows Reduce Hazards		80	%
3. Control Water Accumulation Inside Facility		60	%
4. Control Room Temperature & Humidity		40	%
5. Control Room Air Flow & Room Air Quality		80	%
6. Site Elements Facilitate Sanitary Condition		111	%
7. Envelope Designs Facilitate Sanitary Conditions		120	%
8. Interior Spatial Design Promotes Sanitation		80	%
9. Building Components & Construction Facilitates Sanitary Conditions		63	%
10. Utility Systems Design Prevents Contamination		126	%
11. Adequate Sanitation Systems		70	%
Total Score and Average Percent		1000	%