

A1 STAGE-GATE REVIEW SERIES · LAYOUT

FOOD FACTORY LAYOUT CHECKLIST

A stage-gate review checklist for greenfield and brownfield food & beverage factory layouts — covering material and personnel flow, hygienic zoning, utilities integration and expansion planning. Use it before freezing the concept layout, and again before releasing the detailed layout for civil design.

VERSION 1.0 · JUL 2026 64 CHECKS · 8 SECTIONS GATES: CONCEPT FREEZE · DETAILED FREEZE

HOW TO USE THIS CHECKLIST

- 1 Work through each section against your current layout drawing (block plan or equipment layout). Tick items that are demonstrably satisfied **on the drawing** — not items you intend to fix later.
- 2 Any unticked item in Sections 2–4 (flow and zoning) is a **hold point**: these are structural decisions that become very expensive to change after civil design begins.
- 3 Re-run the checklist at three gates: concept layout freeze, detailed layout freeze, and any time capacity, product mix or hygiene classification changes.
- 4 Best reviewed by a cross-functional team: process engineering, production, quality/food safety, maintenance and EHS — not by the layout engineer alone.

01 SITE & MASTER PLANNING

Get the plot right before the building — orientation, circulation and expansion land are unrecoverable later.

- ☐ Site coverage, FAR/FSI, setbacks and height comply with local development-control norms, with margin for future blocks.
- ☐ Prevailing wind direction checked: ETP, boiler house, DG sets, waste yard and cooling towers located downwind of process and packing areas.
- ☐ Truck circulation is one-way where possible; raw material receipt and finished goods dispatch have separate gates or clearly separated docks.
- ☐ Turning circles, dock apron depths and queuing lengths verified for the largest planned vehicle (reefer / trailer), not the average one.
- ☐ Weighbridge positioned so all inbound/outbound material movement can be captured without crossing internal traffic.
- ☐ Contiguous expansion land reserved on the process/packing growth axis — not fragmented around utilities.
- ☐ Stormwater flows away from docks and material entries; dock levels set against local flood datum.
- ☐ Fire-tender access maintained around the full building perimeter per NBC / local fire norms.
- ☐ Security, visitor parking and employee entry located so no visitor or private vehicle path crosses material movement.

02 MATERIAL FLOW

HOLD-POINT SECTION

The single most common and most expensive layout failure is crossing or reversing material flow.

- ☐ Overall flow is one-directional: receipt → raw storage → preparation → processing → packing → finished goods → dispatch, with no reversals on the flow diagram.
- ☐ Raw material and finished goods never share a corridor, airlock, lift or dock.
- ☐ Flow of packaging materials into packing is segregated from raw/in-process food flow, with its own de-boxing / de-dusting step before entering care areas.
- ☐ Allergen-containing materials have a defined storage, transfer and processing path with segregation or validated scheduling.
- ☐ Rejects, returns and market recalls have a dedicated quarantine area with controlled, documented exit paths.
- ☐ Vertical flow (if multi-storey) uses gravity in the process direction; lifts for materials are dedicated by hygiene class.
- ☐ Internal transfer distances checked for the highest-volume SKU — the largest tonnage travels the shortest distance.
- ☐ Buffer/staging space provided at every process-rate discontinuity (batch↔continuous interfaces, shift-pattern differences).
- ☐ WIP holding conditions (time, temperature) achievable at every staging point shown on the layout.
- ☐ No process or packing area is a through-route to any other area.

03 PERSONNEL FLOW & AMENITIES

HOLD-POINT SECTION

People are the biggest contamination vector — the layout must make the hygienic route the only route.

- ☐ Single controlled personnel entry into the production envelope; hierarchy of change rooms matches the hygiene zoning (low → medium → high care).
- ☐ High-care entry has a dedicated changing regime (captive footwear/garments, hand-wash and sanitation) with no bypass path.
- ☐ Canteen, washrooms and smoking/rest areas reachable without exiting and re-entering through production areas.
- ☐ Washroom doors do not open directly into any production, packing or food storage area (FSSAI Schedule 4 requirement).
- ☐ Visitor and contractor routes defined — viewing corridors or windows provided so audits and customer visits do not require production entry.
- ☐ Maintenance workshop and stores positioned with access to utilities and process areas that does not pass through high-care zones.
- ☐ Personnel and material flows do not cross at any doorway, airlock or corridor pinch point during shift change (check against peak headcount).
- ☐ First-aid room, muster points and emergency egress distances comply with Factories Act / NBC; egress routes do not compromise zoning (alarmed emergency-only doors where needed).
- ☐ QA/QC laboratory located with sampling access to receipt, process and packing without traversing high-care areas; micro lab separated from process air systems.

04 HYGIENIC ZONING

HOLD-POINT SECTION

Zoning must exist in the fabric of the building — walls, air, drains and finishes — not just in colour on a drawing.

- ☐ Layout is colour-blocked into hygiene classes (e.g. non-production / basic / medium care / high care) with a documented rationale per area based on product risk (raw vs RTE, wet vs dry, open vs closed process).
- ☐ Every zone-class transition is a physical barrier (wall + airlock/door discipline), not a painted line on the floor.
- ☐ Air pressure cascade defined: high care positive to medium, medium positive to low; air-handling zones do not mix return air across hygiene classes.
- ☐ Open-product areas identified and given the highest local protection (filtration class, positive pressure, restricted access).
- ☐ Drainage is segregated by zone — high-care drains do not connect upstream of lower-care drains; drain runs slope away from high care.
- ☐ Wall, floor, ceiling and junction (coving) finishes specified per zone class; cleanability standard rises with the zone.
- ☐ Raw and cooked/RTE areas have no shared equipment, utensil wash, or personnel route without a validated decontamination step.
- ☐ Utensil/tote wash areas are zoned (dirty-in / clean-out) and located to serve their zone without crossing classes.
- ☐ Waste exits each zone by the shortest route to the waste corridor/yard, moving only from cleaner to dirtier areas.
- ☐ Pest-management line of defence is visible on the layout: sealed envelope, air curtains/strip doors at material entries, external lighting positioned off the building.

05 UTILITIES & SERVICES INTEGRATION

A layout that ignores services fails at detailed engineering — plan the spine early.

- ☐ Utility block (boiler, compressors, chillers, water treatment) consolidated with a clear utility spine / pipe rack route to process; distribution lengths minimized for the highest-loss services (steam, chilled water).
- ☐ Interstitial service floor or walk-on ceiling provided over high-care areas so maintenance never enters from within the clean zone.
- ☐ Plant rooms and AHUs accessible for maintenance from outside the hygiene envelope; filter changes possible without entering production.
- ☐ Electrical rooms, MCC/PLC panels located out of wet-wash areas, with segregation from steam/water services and adequate cooling.
- ☐ ETP sized area includes sludge handling and tanker access; located per wind direction and with gravity flow from process drains where possible.
- ☐ CIP kitchens positioned central to their user circuits; CIP supply/return lengths checked against velocity and hold-time requirements.
- ☐ Gas storage (ammonia, CO2, N2, fuel) sited per statutory separation distances (PESO/CCoE where applicable) with dedicated access.
- ☐ Solar / future renewable capacity considered in roof structure and orientation.

06 STORAGE & WAREHOUSING

- ☐ Raw material, packaging, finished goods, chemicals and engineering stores are physically separate spaces with independent access control.
- ☐ Racking layout, aisle widths and clear heights verified against the selected MHE (reach truck vs VNA vs forklift) — not assumed.
- ☐ FIFO/FEFO achievable by the physical arrangement (flow-through or accessible racking), not only by WMS discipline.
- ☐ Cold chain: temperature-zoned stores (frozen / chilled / ambient) with airlocks or docks matching the receiving/dispatch temperature regime.
- ☐ Chemical and sanitation store banded, ventilated and outside food storage airspace; allergen storage segregated and labelled.
- ☐ Day stores / line-side stores sized from actual line consumption per shift, so bulk stores traffic does not enter process areas continuously.
- ☐ Pallet exchange or pallet-hygiene step at the boundary where wooden pallets must not enter (medium/high care).

07 EXPANSION & FLEXIBILITY

Most food factories double capacity within 7–10 years — the layout should already know how.

- ☐ A drawn (not verbal) expansion plan exists: which wall opens, which direction each department grows, and what moves out of the way.
- ☐ Utilities sized or space-provisioned for the expansion case (spare bays in boiler/compressor/chiller rooms, spare pipe-rack width, spare panel space).
- ☐ Process area structural grid and clear height chosen for the future equipment generation, not only the current one.
- ☐ Drain, ETP and water systems have declared spare capacity or a defined augmentation path.
- ☐ Expansion construction can proceed while the existing plant operates hygienically (construction access, temporary segregation, dust control).
- ☐ No 'permanent' functions (ETP, substation, deep foundations, statutory structures) placed on the natural expansion axis.

08 REGULATORY & STANDARDS ALIGNMENT

- ☐ Layout reviewed against FSSAI Schedule 4 (or destination-market equivalent: EU 852/2004, US FDA 21 CFR 117) for premises requirements.
- ☐ Certification target (BRCS / FSSC 22000 / SQF) identified now — fabric and zoning requirements of the target standard reflected in the layout.
- ☐ Hygienic design intent aligned with EHEDG guidelines for open-product areas and equipment placement (cleanability access all around equipment).
- ☐ Factory licence, fire NOC, environmental consent (CTE/CTO) and boiler/PESO requirements checked for layout implications before civil freeze.
- ☐ Statutory amenities (washrooms, canteen, creche, first-aid) scaled to peak headcount per Factories Act / local rules.

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