

COLD FACILITY DESIGN CONSIDERATIONS



PRE-CONSTRUCTION CHECKLIST

In cold facilities, most budget and schedule challenges don't come from construction—they come from a few critical design decisions made too quickly or overlooked. Whether building new or modifying an existing structure, this checklist will help you carefully review the setup and flag potential issues before construction.

1. Strategic + Regulatory Alignment

- ▶ What is the primary purpose of the facility (freezer, cooler, mixed-temperature, processing, cross-dock), and what is the expectation of expansion over the next 5–10 years?
- ▶ What are the local zoning restrictions and site constraints, such as building height limits, easements, noise restrictions, traffic patterns, and neighboring uses?
- ▶ What building, fire, and food safety codes and standards, including Owner insurance carrier requirements, apply to the facility?
- ▶ What is the local project approval and permitting process, such as plan commission, zoning, city engineering, and building inspection? What are the costs for permits and fees?

2. Site, Layout & Workflow

- ▶ Has the ideal product flow from receiving → staging → storage → order assembly → shipping, minimizing cross-traffic and backtracking, been mapped?
- ▶ Has adequate space been allocated for rework & repack, labeling, QA/QC, and value-added work?
- ▶ Have clean vs. dirty traffic, allergens, and raw vs. finished product paths been properly separated?
- ▶ Has the truck circulation, dock count, and truck yard been sized for peak efficiency and planned growth?
- ▶ Where will future building expansions occur, and can the construction occur without major disruption?
- ▶ Has access been provided for future equipment installations or upgrades to existing equipment?

3. Temperature Zones & Envelope

- ▶ Have temperature set points and tolerances for each area (e.g., -10°F freezer, 34°F cooler, 40°F dock, ambient) been determined?
- ▶ Are door locations, door types, and air barriers designed to eliminate vapor leaks and frost/ice formation?
- ▶ Are insulation thicknesses, vapor barriers, and floor heating systems coordinated to prevent condensation, frost, and floor/slab heave?
- ▶ Have roof loads (mechanical, piping, solar, snow/ice) and penetrations been considered in the structural design?

4. Refrigeration & Mechanical Systems

- ▶ What refrigerant strategy (Ammonia, CO₂, low GWP synthetic, etc.) best fits the Owner's safety, efficiency, and corporate/environmental requirements?
- ▶ What level of redundancy and resilience is needed for critical temperature zones (e.g., N+1 capacity, backup power, defrost strategy)?
- ▶ What are the Owner's energy efficiency targets, and what measures (VFDs, heat recovery, advanced controls, etc.) will we use to reach them?
- ▶ Has adequate space, access, and safe clearances for installing and maintaining been provided for all mechanical and refrigeration equipment?
- ▶ How will alarms, monitoring, and remote support be handled, and who will be notified in case of issues?

5. Operations, Staffing & Safety

- ▶ What are the planned operating hours and peak staffing levels, and are the parking areas, locker rooms, and welfare areas sized accordingly?
- ▶ How will pedestrian routes be separated from forklift and other material handling traffic, and where are crossings and speed controls needed?
- ▶ Where will hazardous areas (battery charging, refrigeration machinery rooms, flammable storage) be located, and how will hazards such as spill containment and ventilation be handled?
- ▶ Are the life-safety systems (egress routes, emergency lighting, eyewash/showers, gas detection, fire protection) fully coordinated with the cold storage environment?

6. Racking, Automation & Technology

- ▶ What storage strategy (single selective, push back, pallet flow, mobile racking, AS/RS, etc.) best fits the Owner's SKU profile, throughput, and budget?
- ▶ Have the clear heights and fire protection requirements, including in-rack sprinklers, been coordinated with the racking strategy?
- ▶ What IT infrastructure does the Owner need for their WMS/Scanning system? Is the IT equipment located in the freezer and cooler environments properly protected?
- ▶ Has future automation or robotics (conveyors, shuttles, AS/RS, palletizers) been considered in the building structure, footprint, and utilities?

7. Utilities, Energy & Sustainability

- ▶ Does the incoming power service have enough capacity and reliability for current and future loads (including refrigeration, automation, and EV/MHE charging)?
- ▶ Are water, sewer, and gas services sized for all processing, cleaning, and fire protection demands? Have future demands been considered?
- ▶ How will stormwater be managed so that site drainage, icing, and ponding do not create safety or operational issues?
- ▶ What sustainability goals (energy intensity, refrigerant choices, solar readiness, certifications such as LEED) is the Owner targeting, and how will the design support them?

8. Budget, Schedule & Risk

- ▶ Has a realistic budget and schedule been developed and are contingencies for scope changes, code issues, and long-lead equipment included?
- ▶ Which equipment and materials are long-lead items (refrigeration packages, switchgear, racking, automation) and are they identified in the schedule?
- ▶ What is the project phasing and go-live strategy, including cutover from existing facilities and inventory migration?
- ▶ What are the major risks (regulatory, utilities, supply chain, site conditions), and what mitigation plans are in place for each?

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