PEAK
CONSTRUCTION CORPORATION

Build Value.
Design Build.

Keeping It Cool

Freezer / Cooler Requirements to Keep in Mind

Central Grocers | Joliet, IL

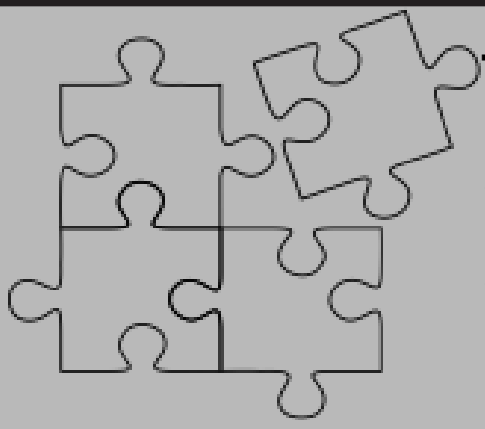
Supply Chain

All great real estate solutions start with understanding the entire chain of activities from origin to final destination. Once a real estate terminology catch phrase, "supply chain" has evolved into a very complex and technical area of study at most major universities.

Temperature Controlled Requirements

Freezer/cooler real estate requirements all start with scope creation and the corresponding details associated with those requirements, including the following key areas:

1. Varieties and quantities of products to be distributed throughout "supply chain"
2. Hazardous Analysis and Critical Control Point (HACCP) plans detailing the products' safe passage requirements from creation to final destination
3. Product variety segregation needs with respect to temperature, humidity, air quality, and possible contamination
4. Low and peak product variety quantities with respect to different times of the year
5. Product variety shelf lives on the supply chain
6. Product origin commonalities and differences
7. Seasonal product volume volatility
8. Product destination commonalities and differences
9. Destination point variations with respect to demand volumes as well as seasons or time of year
10. Destination location regulatory or labor market challenges.



The Real Estate Solution

Once the basic real estate demand details are determined, an appropriate solution can be initiated with a real estate team including brokers, consultants such as licensed designers, attorneys and regulatory incentive specialists, and design/builders.

The right real estate solution is a combination of the following key areas:

1. Required initial facility size and future growth flexibility with respect to overall space or internal flexibility with different temperatures, humidities, air qualities, and possible contamination control
2. Available sites and corresponding land costs
3. Available labor and corresponding costs
4. Available tax or regulatory incentives for specific geographic locations
5. Regulatory approval timing and unique zoning or building code requirements
6. Truck availability, regulatory restrictions, and corresponding transportation costs
7. Rail availability, regulatory restrictions, and corresponding transportation costs
8. Available or newly designed and constructed efficient refrigeration and freezer building space and corresponding costs

Let's Focus

The best solution needs to account for all of these important areas. But let's focus on confirming you're accounting for the following during the building and site analysis:

1. The site design needs to permit rail, trucks and employee vehicles to circulate efficiently and safely during all operating times. If the facility is not 24/7, determine if any access issues during holiday or non-operating exist.

2. Access control, like guard houses, secured parking, or entry points, need to be designed to accommodate peak flow times. Also provide safe depth staging bays for vehicle loading and unloading so operation aisles can be maneuvered with minimal impact.

Keeping Focus

3. Properly divide and control temperature, humidity, and air contamination throughout the spaces. Walls, floors, roofs, and access points must minimize exposures which threatens shelf life.

a. *Temperature Separation*

i. Space requiring temperatures below 32 degrees F need to be properly designed and constructed to operate efficiently, provide access and avoid negative building impacts to adjacent areas. Poor and slow access into freezer areas can cause billowing moisture or fog as it is escapes from access points and mixes with warm air. Air curtains, multiple doors or curtains are good solutions for this.

ii. Under floor heat should be designed and installed to avoid frost build up in subgrades and floor heaves resulting in uneven conditions.

iii. Freezer and refrigeration mechanical equipment should be designed and installed with multiple compressors and variable speed motors to enable the greatest level of efficiency and cost effectiveness as cooling demands change. Equipment sizing and capacity need to consider product loads in addition to infiltration, lights, people, and equipment heat gains.

iv. Fire and smoke detection also present unique challenges in freezer areas. Fire sprinkler systems commonly use glycol or dry systems to avoid freezing and condensation issues. Smoke detection, control wiring, or other conduits for electrical lighting or convenient receptacles need to be sealed entering and exiting any perimeter freezer space penetrations to avoid unwanted condensation forming inside the conduit.

b. *Humidity control and maintaining temperature efficiently* – Layout should be designed with access into and out of varying temperature areas from warmest to coldest. Buffered freezer staging and vestibule points that are maintained at refrigerated temperature levels provide the highest operating efficiencies especially in warm summer conditions.

c. *Gas Generation* - While refrigeration temperature can be modulated mechanically in some spaces that have high variances in product quantities by using insulated hanging curtains, care needs to be taken to make sure harmful gases aren't generated causing cross product contamination.

4. A very important consideration for all refrigerated and freezer areas is detailing exactly how daily maintenance will be performed and how to manage damaged products.

a. All refrigerated areas should be designed and constructed with flat vertical, flush, or angled surfaces to minimize dust build up and or insect or rodent access. Surfaces should be non-porous materials and any applied finishes need to take into account potential thermal effects of sanitation processes.

b. All lighting and other fixtures should be designed and installed for low temperature applications and with closed lens or moisture resistive devices.

c. Determine if fork lift vehicles and/or people require any preventative sanitation run-off mats or different protective uniforms/equipment as well as the maximum time employees can operate in freezer areas.

d. Best practices move and segregate completely contaminated products into areas with independent exhaust and ventilation systems so that all areas avoid unwanted contamination.

Keeping Focus

5. The best and most effective and efficient facilities are the result of many design and construction team members' efforts to make sure all project objectives are understood and completed accordingly.
   a. All projects, no matter how detailed the plans and specifications are, have unforeseen field conditions that must be addressed to meet the design objectives. Every refrigeration or freezer space should be scrutinized over the course of construction to confirm any potential penetration does not pose a threat to unwanted air infiltration.
   b. Each MEFP discipline has to enter and exit refrigerated space to confirm the path of entry provides no unwanted air or thermal access point for unwanted temperatures or humidity issues.
   c. Concealed air pockets, like deck flutes, beam or joist support pockets, hangers, pipes, or sleeves, all need to be carefully scrutinized and sealed to produce the best finished product.
   d. Confirm the perimeter of the building is protected from unwanted air gaps and visitors with exterior doors with closures and thresholds, caulking, weather strips, grommets and/or gaskets.

Contact PEAK Construction To Learn More About Freezer/Cooler Project Best Practices.

EASTLAND FOODS | BOLINGBROOK, IL
Harris Architects

About PEAK Construction Corporation

Peak Construction Corporation is a privately held, well-capitalized design-build firm, based in Chicago with a national reach. For 20 years, the firm has delivered office, industrial, hospitality, healthcare, retail, multi-family, and specialty commercial construction projects for high-profile clients like Coca-Cola, Kraft Foods, DHL, Holiday Inn, and Marriott.

www.peakconstruction.com | 630.737.1500
1011 E. Touhy Avenue | Suite 100 Des Plaines, IL