

| Design Guide Checklist

Cold Storage Integrated Building Envelopes

Cold storage facilities require a precise, integrated building envelope strategy to achieve reliable vapor control, thermal stability, and air and water tightness. These environments go beyond typical construction practices, requiring early identification of key performance drivers is essential to guiding decisions that ensure continuity, redundancy, and long-term durability across all envelope systems.

This checklist is tailored for the unique demands of cold storage facilities to highlight key considerations, define project specific performance criteria, and maintain an integrated building envelope system. Contact Carlisle Design Services for more information at Design.Services@Carlisle.com.

Carlisle Design Services

Contact Carlisle Design Services for project specific design services.	
Quality assurance and performance review	• International building code criteria review • Energy modeling review for roof and wall systems
Integrated system guidance	• Roofing system and tapered insulation design assist • Exterior wall air, thermal, and watertightness drawing or detail verification • Below-grade waterproofing suitability • Critical tie-in condition evaluation
Warranty verification	• Review below-grade, exterior wall, and roofing system design and specification for system specific warranty eligibility and critical tie-in compliance

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Date: _____

Project name: _____

Project address: _____

Define Building Performance

Establish clear performance priorities in early design phases to protect temperature specific project needs, ensure system compatibility, and meet rigorous demands of mission-critical environments. Designing unified, interdependent systems promotes cohesive functionality to meet project specific performance requirements and reduce risk for downtime.

Definitions

Dock temperature zones:	Warm loading areas to reduce ice formation or cold loading areas to protect products
Frost heave:	Sub-slab moisture freezing and expansion causing structural lifting
Defrost cycles:	Scheduled heating intervals to clear frost from evaporators
Infiltration load:	Uncontrolled heat and moisture transmission through open doors or air leaks
Pressure zoning:	Using differential pressures to prevent warm, moist air from entering cold areas
Glycol heating system:	Hydronic heating loops used under slabs and at perimeters to prevent frost heave, maintain temperature stability, and protect the building envelope
Temperature pull down:	Process of lowering the temperature until the desired cold storage temperature is achieved.

Resources

Cold Storage design guidance		
Refrigerated facility design	• ASHRAE Handbook-Refrigeration	• Carlisle cold storage solutions
Air leakage		
• Air and vapor barrier for roofs	• Air barrier assembly air leakage	• Whole building air leakage testing
• Performance testing	• Air Barrier Association of America	
Watertightness		
• Waterproofing risk assessment	• Water penetration testing	• Electronic Leak Detection
• Blindside waterproofing tie-ins		
Thermal resistance		
• Testing for R-value	• EPA Complaint	• No CFCs, HFC, HCFCs
Wind resistance		
Roofing Systems	• Roofing design references	• ASCE vs FM
	• FM 1-90 vs ASCE 7	• FM Approved systems
Perimeter edge metal	• ANSI/SPRI/GT-1	• ASCE Hazard tool
	• ANST/SPRI/FM4435/ES-1	• Wind speed calculator
Fire resistance		
Roofing systems	• UL Fire Classifications	
Integrate walls systems	• NFPA 285 compliance	

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Design awareness and considerations

Controlled-atmosphere storage spaces require significantly higher airtightness than conventional refrigerated rooms. Integrated building envelope strategies should account for enhanced sealing expectations and may warrant verification of airtightness performance.

Performance Priorities

Types of cold storage

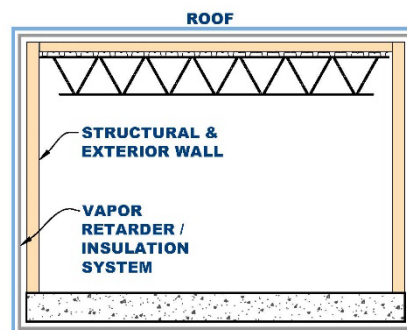
- Cold storage classification types
- [] Controlled atmosphere for long-term fruit and vegetable storage
 - [] Coolers and chilled storage (32° F, 0° C)
 - [] High-temperature freezers (27° F to 28° F, -2° C)
 - [] Low-temperature storage (-5° F to -20° F, -21° C to -30° C)
 - [] Blast freezers (-40° F, -40° C) or colder

Common construction methods

Refer to the *2022 ASHRAE Handbook – Refrigeration*, chapter 23 refrigerated-facility design for more information.

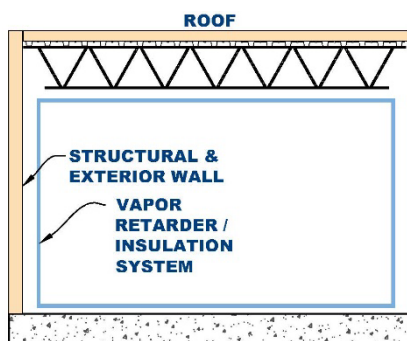
Total exterior vapor retarder and insulation system

- Encapsulate structural system with vapor retarder and insulation.
- Vapor retarder and insulation installed under floor, outside of walls, and over roof deck.
- Offers the least number of penetrations through the vapor barrier.



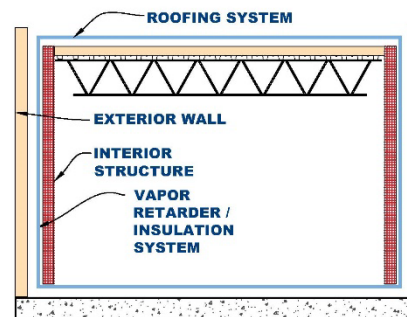
Entirely interior vapor retarder and insulation system

- Install vapor retarder within the room (outside of the enclosure)
- Install insulation to the walls, floors, and suspended ceiling.
- Commonly used in the following applications:
 - Walls and ceiling must be washed.
 - Existing structure is converted to a refrigerated space.
 - Small room located within large coolers or unrefrigerated facilities as part of a food processing facility.



Interior and exterior vapor retarder and insulation system

- Interior structural system tied to an exterior curtain wall of masonry or similar material.
- Vapor retarder and insulation system turn up and over a roof deck to incorporate into the roofing system.
- Roofing system serves as a vapor retarder.



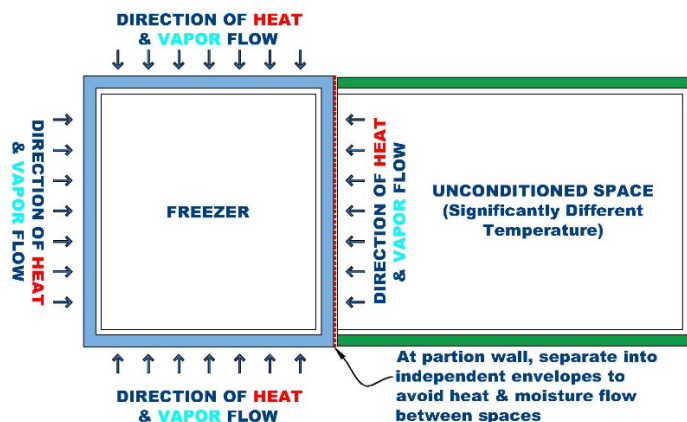
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Adjacent areas with significantly different temperatures

- Separate into independent envelopes to avoid heat and moisture flow between spaces.
- Avoid penetrating the vapor retarder and insulation system.
- Refer to the *2022 ASHRAE Handbook – Refrigeration, Section: Space Adjacent to Envelope* for penetration sealing guidance.



Critical systems and environmental sensitivities

- Establishing and maintaining uniform temperatures
- Airflow pathway routes and potential obstructions
- Humidity and ventilation control systems
- Air movement impacts on worker comfort and safety
- Environmental controls at storage access points
- Temperature-based storage duration
- Frost heave
- Fire suppression systems

Design sensitivity and building envelope implications

Roofing system	☐ Yes ☐ No	FM Insured
Integrated wall system	☐ Yes ☐ No	NFPA 285 Compliance
Airflow, pressurization, and contaminant control	• Confirm continuity and performance of air barrier systems. • Coordinate envelope design with vapor control, mechanical pressurization strategies, and isolated temperature specific environments. • Validate compartmentalization and pressure zoning for critical spaces. • Specify door seals, vestibules, and entry filtration to prevent moisture collection. • Include construction-phase protection measures to maintain envelope integrity.	
Thermal and moisture control	• Model dew point location to prevent condensation within assemblies. • Include envelope commissioning and performance testing protocols. • Ensure continuous thermal insulation across building envelope transitions • Specify continuous air and vapor barrier based on climate and interior conditions. • Coordinate HVAC humidity control with envelope moisture management. • Allow for thermal contraction of insulation during temperature pull down. ◦ Initial startup, loading warm product, door openings or infiltration events, maintenance downtime, and defrost cycles	
Waterproofing systems and drainage paths	• Identify site specific needs to determine moisture-resistant requirements. • Include watertightness testing protocols. • Understand detail flashing, sealants, and transitions to prevent water entry. • Install integrated leak detection systems (e.g., conductive roofing system primer)	
Glycol heating systems	• Understand when to include glycol heating systems to prevent freezing, control condensation, and support overall thermal performance.	
Penetrations and system integrations	• Minimize and seal penetrations. • Provide access to critical areas for maintenance. • Verify joints and penetrations are sealed after temperature pull down.	

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Maintenance protocols	
Scheduled maintenance	• HVAC services (rooftop units, condensers, chillers) • Generator exhaust inspections • Solar panel cleaning or repair (if installed) • Drainage system cleaning (roof drains, scuppers, gutters) • Roof membrane inspections for damage from foot traffic or equipment • Frost build-up inspections • Plenum inspection for roof leaks or condensation • Wall and ceiling seal verification around openings for ducts, pipes, and wiring
Other considerations	
• International Building Code (IBC) • International Energy Conservation Code (IECC) • ASHRAE Handbook - Refrigeration • Texas Department of Insurance (TDI) • California Code Regulations, Title 24	• Florida Product Approval ○ HVHZ (High Velocity Hurricane Zone) ○ Non-HVHZ (Non-High Velocity Hurricane Zone) • FM Insured Roofing System

Analyze Site and Environmental Conditions

Understanding site conditions and protecting cold storage from extreme weather are essential to long-term building performance. Early analysis helps identify risks, guide system selection, and prevent costly surprises. Factors such as performance requirements, wind loads, fire resistance, and local codes influence wall assembly design, cladding attachment, roof wind-uplift resistance, and perimeter edge metal detailing.

Design awareness and considerations

- **Hurricanes and tornados:** Specify high wind resistant roofing and metal edge requirements.
- **Seismic activity:** Verify roofing, wall, and waterproofing warrantable expansion joint details.
- **Hail:** Specify a coverboard and high-impact membrane to protect insulation and roofing.
- **Extreme vapor drive:** Contact Carlisle Design Services for an energy modeling review.
- **Wildfire risk:** Specify Class A fire-rated materials.
- **High-level solar exposure:** Consider white PVC and TPO for UV resistance and reflectivity.
- **Frost susceptible soils:** Consider glycol heating system at below-grade applications.
- **Soil and ground water contaminants:** Verify waterproofing protects occupants from contaminant transmission.

Wind Exposure and Weather Extremes

Site specific risks					
☐ Yes	☐ No	Hurricanes	☐ Yes	☐ No	Seismic activity
☐ Yes	☐ No	Snow loads	☐ Yes	☐ No	Flood zones
☐ Yes	☐ No	Construction-generated moisture	☐ Yes	☐ No	Wildfire risk
☐ Yes	☐ No	High-level solar exposure	☐ Yes	☐ No	Tornados
☐ Yes	☐ No	Hail	☐ Yes	☐ No	Extreme vapor drive
Notes					

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Site Conditions

☐ Yes	☐ No	Geotechnical report						
Soil conditions								
☐ Yes	☐ No	Expansive or unstable soils	☐ Yes	☐ No	Radon	☐ Yes	☐ No	Saltwater
☐ Yes	☐ No	Frost susceptible soils	☐ Yes	☐ No	Methane	☐ Yes	☐ No	Sulfates
☐ Yes	☐ No	Hydrocarbons	☐ Yes	☐ No	Chloride	☐ Yes	☐ No	Other
Water table								
Describe location of water table relative to bottom of slab:								
☐ Yes	☐ No	Hydrostatic pressure						
Drainage strategy								
Describe drainage strategy:								
☐ Yes	☐ No	Dewatering plan	☐ Temporary		☐ Permanent			
☐ Yes	☐ No	Site grading						
☐ Yes	☐ No	Sub-slab drainage						
Energy modeling (collect information needed for each wall or roof condition)								
Classification	☐ Short - up to 35'-0" (10 meters)		☐ Tall - greater than 35'-0" [10 meters]					
Building height:								
Building moisture	☐ Low moisture load		☐ Medium moisture load			☐ High moisture load		
Assembly location:	☐ Vertical wall (90 degrees)		☐ Horizontal roof (0 degrees)					
Exterior surface color and texture (e.g., red brick):								
Interior surface coating/finish (e.g., latex paint, vinyl wallpaper):								

Account for Operational Demands

Designing for operational realities is essential to ensure the building envelope performs reliably under the unique stresses of cold storage. These demands influence system selection, detailing, and long-term maintenance.

Design awareness and considerations

- **Maintenance access:** Specify protection mats or walk pads in high traffic areas.
- **Equipment penthouse:** Consider feasibility to simplify access and limit roof penetrations.
- **Rooftop equipment:** Insulate and raise curbs to limit roof membrane heat exhaust exposure.
- **Penetrations:** 6" [150 mm] minimum clearance between penetrations for optimal flashing
- **Heavy traffic and loading docks:** Specify chemical resistant traffic coatings to limit abrasion.
 - Forklift and pallet-jack traffic tight turning areas (door thresholds, dock levelers, corners)
 - Exterior ramps
 - Dock aprons
 - Slip resistant areas required under OSHA or local safety policies
 - Traffic patterns requiring high-visibility line striping and demarcation

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Operational Demands

Heavy equipment loads					
☐ Yes	☐ No	Refrigerator systems	☐ Yes	☐ No	Generator exhausts
☐ Yes	☐ No	Condensers and evaporators	☐ Yes	☐ No	High-speed doors and dock equipment
☐ Yes	☐ No	Material-handling equipment	☐ Yes	☐ No	Control systems and monitoring
☐ Yes	☐ No	Dehumidification systems	☐ Yes	☐ No	Forklift battery charging stations
☐ Yes	☐ No	Automation	☐ Yes	☐ No	Fire suppression system
☐ Yes	☐ No	HVAC for support spaces	☐ Yes	☐ No	Hazardous material handling
☐ Yes	☐ No	Refrigerant piping networks	☐ Yes	☐ No	Other
Maintenance Access					
Allow safe, non-invasive access for inspection and repair that do not compromise roofing continuity or warranty eligibility.					
Access points	☐ Walkways	☐ Roof hatches	☐ Removable panels	☐ Equipment penthouse	
Notes					

Anticipate Continuous Insulation and Vapor Retarder Systems

Continuous insulation (CI) and vapor retarder systems are critical for maintaining thermal and moisture stability in cold storage, where tightly controlled temperatures affect equipment performance, cooling efficiency, and the risk of condensation or frost. Design insulation and vapor retarders holistically across all assemblies so thermal, vapor, and moisture control layers remain continuous and support the performance of adjacent control layers.

Design awareness and considerations

- **Pull-down thermal contraction:** Specify flexible vapor retarders and flashing to accommodate movement without performance loss.
- **Expansion joints:** Coordinate thermal and vapor protection around expansion joints
 - Avoid exposed metal covers bridging areas with significantly different temperatures.
 - Verify warranty requirements at this critical tie-in location.

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Continuous Insulation

Implement uninterrupted thermal control

- Design insulation continuously at underslab, below-grade, walls, and roof assemblies to prevent thermal breaks.
- Identify minimum thermal resistance requirements.

Verify thermal bridging challenges

Slab-to-wall:

Wall-to-roof:

Penetrations:

Framing supports:

Cladding supports:

Continuous Vapor Retarder

Implement uninterrupted vapor control

- Integrate the vapor retarder on the warm side of the insulation or as determined by hydrothermal analysis.
- Verify system specific tie-ins, sealants, or other methods to ensure vapor barrier continuity from one system to another (e.g., wall to roof, wall to floor, or wall to ceiling).
- Coordination of trades and warrantable transitions at critical tie-ins is crucial to protect against condensation on the inside of cold storage areas.

Verify vapor retarder tie-in challenges

Slab-to-wall:

Wall-to-roof:

Penetrations:

Framing supports:

Cladding supports:

Notes

Design for Redundancy and Resilience

In cold storage facilities, discontinuities in the air and vapor control layers directly increase infiltration loads, frost formation, and refrigeration energy demand. Maintaining envelope continuity is a primary driver of both operational efficiency and long-term durability, not just code compliance. When these barriers are truly continuous and coordinated, they maintain stable interior conditions, reduce energy loads, and prevent degradation in environments where precise climate control and uptime are essential.

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Design awareness and considerations

Pre-applied waterproofing

- **Structural slab thickness:** 24" [600 mm] or greater may require rebar removal if the membrane is damaged during construction. Specify a high-puncture resistance pre-applied waterproofing system to protect against construction site damage.
- **Concrete coverage:** Verify waterproofing concrete coverage requirements.
 - Typical systems recommend 10" [225 mm] minimum structural concrete coverage to allow for 6" [150 mm] flashing and 3" [75 mm] swellable waterstop.
 - Enhanced detailing: May require increased concrete coverage. Refer to product specific details for detailing requirements.
- **Secured pipe stub out:** Limit pipe stub out length so base of pipes are accessible for hand-flashing and proper termination sealing.
 - Typical range depending on site conditions: 9-18" [225-450 mm]

Insulation compressive strength

- **Underslab:** 25 – 60 psi minimum compressive strength, Type IX or high-density EPS are common considerations based on cold storage use. Coordinate insulation type and minimum compressive strength with structural design requirements.
- **Foundation walls:** Cold storage facilities may consider matching underslab insulation at foundation walls for robustness and consistency. Coordinate insulation type and minimum compressive strength with structural design requirements.

Underslab and foundation wall waterproofing

- Underslab and foundation wall waterproofing tie-in is a critical juncture. Contact Carlisle Design Services for project specific recommendations.
- Specify a critical tie-in compatibility warranty to ensure chemical and adhesion compatibility. Refer to Specification Coordination Strategies section of this Design Guide Checklist.

Prefabricated drainage composite

- Consider a drainage composite with a poly backing to protect waterproofing from embedment or damage during backfill placement.

Integrated Below-Grade Systems

Integrated slab systems

Subbase preparation: ☐ Mud slab ☐ Compacted gravel ☐ Compacted earth

☐ Yes ☐ No Contaminants identified in soil If yes, list:

☐ Yes ☐ No Glycol heating system Location(s):

☐ Yes ☐ No Pre-applied underslab waterproofing

☐ Yes ☐ No Sub slab

☐ Yes ☐ No Insulation Minimum R-value: Minimum compression strength (lb/sf):

☐ Yes ☐ No Vapor barrier

☐ Yes ☐ No Structural slab greater than 24" [600 mm]

Integrated foundation wall system

☐ Cast-in-place concrete ☐ Precast concrete ☐ Shotcrete ☐ Concrete Masonry Units (CMU)

☐ Yes ☐ No Pre-applied foundation wall waterproofing Location(s):

☐ Yes ☐ No Post-applied foundation wall waterproofing Location(s):

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☐ Yes	☐ No	Glycol heating system	Location(s):
☐ Yes	☐ No	Insulation	Minimum R-value: Minimum compression strength (lb/sf):
☐ Yes	☐ No	Prefabricated drainage composite	

Site conditions

☐ Yes	☐ No	Slab anchor design	☐ Sleeve	☐ Blocked out
☐ Yes	☐ No	Support of excavation (SOE)	Type and design:	
☐ Yes	☐ No	SOE retention anchors and tiebacks	Type and design: Dimensions:	
☐ Yes	☐ No	Rakers and walers	Type and design:	
☐ Yes	☐ No	Rakers and waler removal	Removal process:	
☐ Yes	☐ No	Elevator pit		
☐ Yes	☐ No	Non-standard detail considerations	Conditions:	

Waterstops

☐ Yes	☐ No	Swells in contact with water
☐ Yes	☐ No	Chemical grout

Notes

Design awareness and considerations

- **Exterior insulated wall panel to below-grade waterproofing:** Coordinate below-grade waterproofing and underslab vapor barrier tie-in to wall panel. Protect transition from UV where transition occurs on exterior face of wall panel.
- **Exterior insulated wall panel to roofing:** Common continuous insulation strategies include cutting a thermal break on the interior side of the insulated wall panel and filling the gap between the wall panel and roof insulation with spray foam.

Integrated Wall Systems

Integrated wall system			
Base wall system(s)	☐ Steel studs ☐ Other	☐ Concrete	☐ CMU
Interior insulation	☐ None ☐ Polyisocyanurate	☐ Insulated panel ☐ Spray foam	Panel type: ☐ Other
Interior finish	☐ None ☐ Other	☐ Insulated panel	Panel type:

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Exterior sheathing	☐ None	☐ 1/2" thick, exterior grade gypsum sheathing	☐ 5/8" thick, type X, exterior grade gypsum sheathing
Exterior insulation	☐ None	☐ Polyisocyanurate	☐ Expanded polystyrene
Exterior veneer	☐ None ☐ Masonry	☐ Insulated panel ☐ Stucco	Panel type: ☐ Other

Site specific conditions

☐ Yes ☐ No UV exposure limitations during construction

☐ Yes ☐ No Extreme weather conditions during construction

Performance criteria

Air barrier permeance: ☐ Permeable ☐ Non-permeable

Drainage efficiency: Flow rate:

Notes

Design awareness and considerations

- **Maximize insulation performance:**
 - Specify high-performance, R-7 per inch polyiso insulation in the roofing system.
 - Fill metal deck flutes with spray polyurethane foam to block air pathways, thermal bridging and reduce condensation and frost risk.
- **Promote positive drainage:** Contact Design Services for roofing system and tapered insulation design assist.
 - Verify roof top units do not impede drainage path.
 - Align drains for optimal drainage efficiency.
- **Watertightness verification:** Consider electronic leak detection and long-term continuously monitored watertightness for critical building types where pinpointing exact areas of damage, and real time monitoring of roofing system. Contact Carlisle Design Services for long-term monitoring solutions.

Integrated Roofing Systems

Integrated roof system

Roof deck type: ☐ Steel, less than 22 gauge ☐ Lightweight insulating concrete over steel
☐ Steel, 22 gauge or heavier ☐ Other
☐ Structural concrete

☐ Yes ☐ No Spray polyurethane foam installed under deck

☐ Yes ☐ No Spray polyurethane foam installed as infill to top of metal deck flutes

☐ Yes ☐ No Deck level air and vapor barrier

☐ Yes ☐ No Insulation Minimum R-value: Minimum compression strength (lb/sf):

☐ Yes ☐ No Roof deck board

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Roofing system: ☐ EPDM (Ethylene Propylene Diene Monmer) Thermoset Single-Ply Roofing
☐ PVC (Polyvinyl Chloride) Thermoplastic Single-Ply Roofing
☐ TPO (Thermoplastic Polyolefin) Thermoplastic Membrane Roofing

☐ Yes ☐ No Structurally sloped deck to drains, scuppers, or roof edge Slope:

Ceiling type: ☐ Exposed deck ☐ Insulated panel Panel type:
☐ Suspended ceiling ☐ Other

Building use at roof(s)

☐ Yes ☐ No Unoccupied roofing system

☐ Yes ☐ No Mechanical units

☐ Yes ☐ No Solar panels

Drainage

Drainage outlet type: ☐ Roof drains ☐ Scuppers ☐ Gutters at roof edge

Overburden type(s)

☐ None ☐ Pavers ☐ Vegetative roof system ☐ Other

Site specific conditions for design pressures based on ASCE 7

- Building location (address)
- Risk category assessment
- Surrounding environments
- Building height

Watertightness verification

Watertightness testing: ☐ Electronic Leak Detection (ELD) ☐ Flood test

Long-term monitoring: ☐ Quality control (passive) ☐ Continuously monitored (active)

Notes

Design awareness and considerations

- Roof-to-wall transitions are often the most failure-prone areas in cold storage, due to thermal pull-down and long-term differential movement. Address critical tie-ins early in design to maintain continuous air, vapor, and thermal control layers.
- Specify a critical tie-in compatibility warranty to ensure chemical and adhesion compatibility. Refer to Specification Coordination Strategies section of this Design Guide Checklist.
- Contact Carlisle Design Services for project specific design review and critical tie-in warrantability.

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Critical Tie-ins

Critical tie-in conditions

- ☐ Below-grade
 - ☐ Below slab-to-foundation wall
 - ☐ Below-grade waterproofing-to-below-grade insulation and drainage
 - ☐ Foundation wall-to-above grade wall
- ☐ Insulation and cladding attachments
- ☐ Above grade wall-to roofs and decks
 - ☐ Above grade wall-to-wall insulation and cladding
 - ☐ Above grade wall-to-deck
 - ☐ Above grade wall-to-roofing
- ☐ Roofing
 - ☐ Roofing-to-deck
 - ☐ Roofing-to-perimeter edge metal
 - ☐ Roofing-to-gutters

Expansion joints

- | | | | |
|------------------------------|-----------------------------|-------------------|-----------------------|
| ☐ Yes | ☐ No | Slab | Anticipated movement: |
| ☐ Yes | ☐ No | Foundation walls | Anticipated movement: |
| ☐ Yes | ☐ No | Above grade walls | Anticipated movement: |
| ☐ Yes | ☐ No | Roofing | Anticipated movement: |

Penetrations

- | | | | |
|------------------------------|-----------------------------|-----------------------------------|--------------|
| ☐ Yes | ☐ No | Pipe clusters | Location(s): |
| ☐ Yes | ☐ No | Penetration exceeds 180°F (82° C) | Location(s): |

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Coordinate Specifications for Integrated Performance

Coordinating specifications is essential for translating performance goals into enforceable actions across the project team. Defining building envelope performance goals early sets the foundation for how control layers like air, vapor, thermal, and moisture barriers are managed throughout design and construction.

Key Specification Sections

Division 01 General Requirements

- ☐ Section 01 35 13 – Special Project Procedures at Critical Tie-ins
- ☐ Section 01 43 39 – Mockups
- ☐ Section 01 83 00 – Facility Shell Performance
- ☐ Section 01 91 00 – Commissioning

Division 03 Concrete

- ☐ Section 03 15 13 – Waterstops

Division 07 Thermal and Moisture Protection

Waterproofing products

- ☐ Section 07 13 00 – Sheet Waterproofing
- ☐ Section 07 14 00 – Fluid-Applied Waterproofing
- ☐ Section 07 18 00 – Traffic Coatings

Insulating products

- ☐ Section 07 21 00 – Thermal Insulation

Air barrier products

- ☐ Section 07 26 00 – Vapor Retarders
- ☐ Section 07 27 00 – Air Barriers

Roofing products

- ☐ Section 07 53 23 – EPDM Thermoset Single-Ply Roofing
- ☐ Section 07 54 19 – PVC Thermoplastic Single-Ply Roofing
- ☐ Section 07 54 23 – Thermoplastic Polyolefin (TPO) Membrane Roofing
- ☐ Section 07 71 00 – Roof Specialties

Specification Coordination Strategies

Section 01 35 13 – Special Project Procedures at Critical Tie-ins

Administrative requirements

- ☐ Assign critical tie-in warranty submittal responsibility to the General Contractor.
- ☐ Define entity to maintain records of site tests and inspection reports related to critical tie-ins
- ☐ Require pre-installation meetings to verify project specific conditions and warranty eligibility.

Quality assurance and quality control

- ☐ Verify manufacturers of products at critical tie-ins provide building envelope system compatibility warranties.
- ☐ Require mock-ups for critical tie-in conditions.
- ☐ Conduct site tests and inspections.
- ☐ Verify air and watertightness at penetrations by subsequent trades.

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Plan for Verification Compliance

Performance verification is essential to ensure building envelopes function as intended and remain protected under manufacturer warranty. These steps help reduce risk, support commissioning, and maintain long-term reliability. Understanding manufacturer and installer workmanship warranties at critical tie-ins is key to ensuring accountability and compliance.

Quality Assurance and Quality Control

Mockups	
☐ Below slab-to-foundation wall	☐ Above grade wall-to-roofing
☐ Below-grade waterproofing-to-below-grade insulation	☐ Roofing-to-deck
☐ Foundation wall-to-above grade wall	☐ Roofing-to-perimeter edge metal
☐ Above grade wall-to-wall insulation	☐ Roof edge-to-gutters
☐ Above grade wall-to-architectural metal panels	☐ Complex geometries
☐ Above grade wall-to-deck	
Site tests and inspections	
☐ Substrate verification	☐ Building envelope system integrity test
☐ Tie-in at critical transitions	☐ Final inspection of tie-ins prior to covering
☐ Penetrations by subsequent trades	☐ Electronic Leak Detection – quality control (passive)

Design awareness and considerations

Contact Carlisle for system specific warranty eligibility, installation guidance, and critical tie-in warranty program information.

Carlisle Integrated Building Envelope Solutions

Carlisle companies with products eligible for inclusion in a building envelope system compatibility warranty	
Roofing	Carlisle SynTec Systems (800) 453-2554 www.carlislesyntec.com Versico Roofing Systems (800) 992-7663 www.versico.com
Waterproofing, air barriers, and traffic coatings	Henry a Carlisle Company (800) 486-1278 www.henry.com
Insulation	Hunter Panels (888) 746-1114 www.hunterpanels.com Insulfoam (800) 248-5995 www.insulfoam.com
Architectural metals	Citadel Architectural Products (800) 446-8828 www.citadelap.com PAC-CLAD Petersen (847) 981-4707 www.pac-clad.com