

CAVE A' VIN | BUILDER FIELD GUIDE

Framing, Thermal Envelope & MEP Rough-In Execution for Wine Cellars

JOB SITE FIELD MANUAL

For: General Contractors, Framers, Electricians, Plumbers
Critical Rule: Zero Thermal Bridging & Complete Envelope

CRITICAL WARNING FOR PROJECT MANAGERS & SUPERINTENDENTS: A wine cellar operates at 55°F year-round. Any framing void, unfoamed electrical box, uninsulated pipe penetration, or can light fixture will cause severe interstitial condensation, rotting drywall, and mold growth inside the wall cavity. Follow these strict rough-in rules.

1. FRAMING RULES: WALL STUDS, CORNERS & DROPPED CEILINGS

2x4 FRAMING RESTRICTIONS

ZERO MEP penetrations allowed in 2x4 walls.

- Standard electrical boxes are >3" deep. In a 3.5" stud bay, a box leaves <0.5" of space, completely preventing spray foam insulation behind it.
- If a wall is framed 2x4, it must be 100% solid foam (3.5" shaved flush to studs) with **NO outlets, switches, or pipes.**

2x6 FRAMING MANDATORY FOR MEP

Use 2x6 framing wherever services are located.

- **Outlets & Switches:** 2x6 gives 5.5" depth, leaving 2"+ of closed-cell spray foam completely encapsulating the back and sides of electrical boxes.
- **Condensate Wall:** The insulated drain line requires a 2x6 stud wall so foam can encapsulate the pipe without displacing structural studs.

Framing & Dropped Ceiling Construction Sequence (Per Cave a' Vin CAD Detail)

- **Wall Corners:** Leave a **1" continuous gap at all wall framing corners** so closed-cell spray foam flows completely behind framing members to eliminate thermal bridging.
- **Exterior CMU Block Walls:** Require a minimum of **3.5" of continuous closed-cell spray foam** directly adhered to the block before drywalling.
- **Continuous Dropped Ceiling Assembly:**
 1. Fasten **1/2" Plywood deck** directly to the underside of the floor trusses/structural joists across the entire wine room footprint.
 2. Frame a dropped ceiling beneath the plywood utilizing **flat 2x4 dropped framing with a 2x2 perimeter nailer** (5.5" total dropped cavity height).
 3. Spray foam contractor installs **4" thick closed-cell spray foam** continuously across the plywood deck and around dropped ceiling framing.
 4. Hang **1/2" moisture-rated drywall** (green/purple board) directly to the bottom flat 2x4 members.

2. CLOSED-CELL SPRAY FOAM DEPTH REQUIREMENTS

Location / Exposure Condition	Required Foam Thickness	Field Execution Instructions
Ceiling Under Hot / Unconditioned Attic	5.0" Minimum	Attic temperatures exceed 130°F. Apply minimum 5" closed-cell foam. Increase thickness if roof deck is uninsulated.
Ceiling Under Conditioned Living Space	3.0" to 4.0"	Continuous spray across 1/2" plywood deck and dropped framing cavity.
	3.5" Minimum	

Location / Exposure Condition	Required Foam Thickness	Field Execution Instructions
Exterior / Sun-Exposed Walls (CMU or Frame)		Ensure full continuous bond to masonry. No voids around furring or anchor brackets.
Interior Partition Walls (Conditioned on both sides)	3.0" to 3.5"	If 2x4 framing, shave flush with stud face. If 2x6 framing, ensure full fill behind electrical boxes.

3. ELECTRICAL ROUGH-IN SPECIFICATIONS

STRICTLY FORBIDDEN IN CEILINGS

- **NO Recessed Can Lights:** Can lights violate the vapor barrier and create localized heat hotspots that ruin wine.
- **NO Built-In Fixture Transformers:** Wafer lights with top-mounted integrated junction box/driver cannot be installed because the driver will be buried in closed-cell spray foam, causing driver burnout and fire hazards.

APPROVED LIGHTING METHODS

- **Shallow Pancake Boxes:** Surface-mounted ceiling fixtures attached to pancake boxes sealed with acoustic gasketing.
- **Ultra-Thin Flat LED Wafers w/ Remote Drivers:** Fixture must connect via low-voltage whip to a **remote transformer** located outside the thermal envelope (in mechanical space or ceiling access).

4. MECHANICAL ROUGH-INS: LRC EVAPORATOR, COPELAND CONDENSER & DRAIN

Mechanical Element	Rough-In Requirement	Subcontractor Responsibility
Refrigerant Line Set	Suction + Liquid line + 18/4 control wire. Run to outdoor condenser.	Length Limit: Max 50 ft equivalent run for smaller units; max 75 ft for large units (includes vertical rise). Small compressors cannot return oil over long runs.
Condenser Mounting	Air-cooled unit outside (~microwave size).	Mount on exterior wall using aluminum hurricane brackets . Provide dedicated high-voltage disconnect per unit data plate.
Condensate Drain Line	Rigid PVC/copper with insulation wrap. Must maintain 1/4" per ft gravity slope.	Run through 2x6 wall only. Preferred: Run below slab during groundwork. NO CONDENSATE PUMPS (pumps fail and flood cellars).
Evaporator Location	LRC Commercial In-Room Low-Profile Coil.	Mount inside cellar. Maintain clear step-ladder access beneath unit for future coil cleaning and filter changes. Do not box in.

5. PRE-DRYWALL SUPER'S SIGN-OFF CHECKLIST

☐ Wall Stud Check: All walls with electrical boxes, switches, or condensate drains are framed with 2x6 studs .	☐ Ceiling Lighting: Zero recessed can lights installed. Wafers have remote drivers outside foam.
☐ Corner Foam Clearance: 1" gap verified at all framing corners for continuous foam envelope.	☐ Condensate Line Fall: Condensate line insulated and gravity pitched; zero mechanical pumps.
☐ Dropped Ceiling: 1/2" plywood fastened to floor trusses with flat 2x4 framing and 2x2 nailer.	☐ Refrigerant Run Length: Line set measured and within 50' (small) or 75' (large) total equivalent limit.
☐ Foam Depths Verified: 5"+ under attic, 3"-4" under conditioned floor, 3.5" on exterior walls.	☐ Drywall Specification: 1/2" moisture-resistant drywall (green/purple board) on jobsite.