CAMBRIDGE

ELEVATING

DESIGN GUIDE

PREMIUM HYDRAULIC + ELECTRIC RESIDENTIAL ELEVATORS

cambridgeelevating.com

Introduction

This guide is designed to assist in the early stages of planning a home elevator installation. It provides nominal dimensions and general specifications to support design, layout, space allocation, and construction considerations.

WHO IS THIS FOR?

This guide is intended for architects, builders, contractors, homeowners, and elevator professionals involved in planning a residential elevator project. It has been structured to follow the natural progression of a project—from initial design and model selection through to construction and finishing—allowing it to be used as a step-by-step reference. While it serves as a valuable tool for preliminary planning, final construction should always be based on the project-specific application drawings supplied by Cambridge Elevating.

CODES & STANDARDS

All installations must comply with applicable safety codes. This guide reflects the requirements of ASME A17.1-2022 Part V / CSA B44:22. Please note that specifications are subject to change without notice due to product enhancements and evolving code standards.

Resources

CAB DRAWINGS

CAB STYLES, FINISHES + FIXTURES

CONTACT:

Cambridge Elevating

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Design + Construction Pathway

Use this guide to navigate directly to the sections relevant to your role in the project.

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Design + Selection

Defining Rider Use

Understanding your customer's intended use and mobility needs is the first step in choosing the right model. For example, if the client has no mobility challenges and simply wants the convenience of an elevator, the Elmira is an excellent fit. However, if the client requires full accessibility, the Cambrian may be the better choice with its easy one-touch automatic operation. Defining the purpose upfront ensures the right model is selected and sets the stage for the rest of the project.

Choosing Drive System + Model

DRIVE SYSTEM

In order to choose the appropriate drive system, please refer to page 5 for the drive system comparison.

MODEL

The performance of, and rider interaction with the door systems is the defining characteristic of each model. Below are the various models offered by Cambridge Elevating.

Elmira	Heritage	Cambrian
Manual (or automatic) accordion cab gate with swing landing door	Automatic commercial-style sliding cab door panels with swing landing door	Automatic commercial-style sliding door panels on both cab and landings

Space + Design Requirements

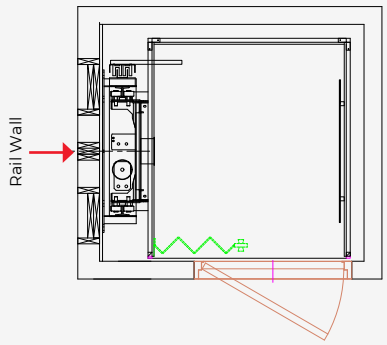
STEP 1

Determine the desired cab size before finalizing the hoistway dimensions. This ensures the cab will be comfortable and practical for your customer's needs. If the hoistway size is set first, it can limit cab options—often resulting in a space that feels too small or unsuitable for its intended use.

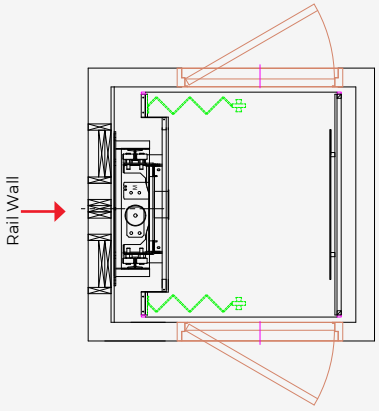
STEP 2

Determine the cab configuration from one of the 4 options illustrated below:

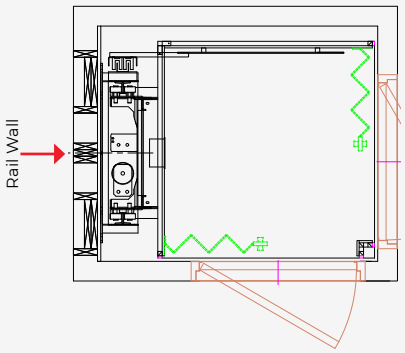
TYPE 1 LEFT / RIGHT IN-LINE



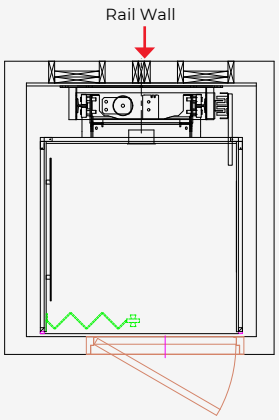
TYPE 2 LEFT / RIGHT THRU



TYPE 3 & 4 90 DEGREE



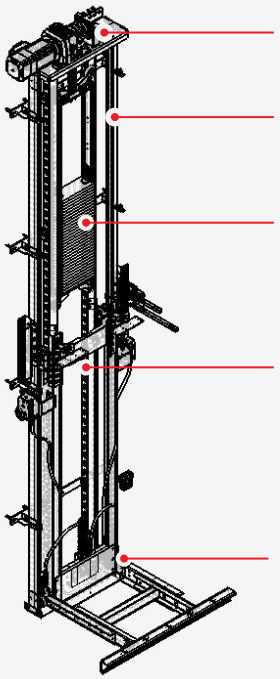
TYPE 5 REAR IN-LINE



CLICK HERE OR SCAN TO VIEW CAB SIZES + CONFIGURATIONS

Drive System Comparison

ELECTRIC DRIVE



SUITABLE APPLICATION

- Ideal for townhomes and homes with narrow footprints, as no hydraulic cylinder is required
- Well-suited for flood-prone areas since all mechanical components are located at the top of the hoistway, not at the lowest landing

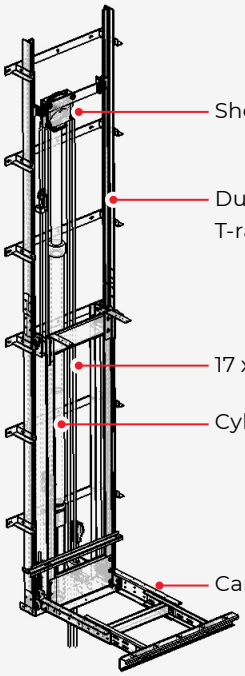
EQUIPMENT

- 3-phase, VFD controlled motor
- 2HP geared counterweight chain
- Dual 8lb modular t-rail system & counterweight track
- Two #60 ANSI roller chains

SAFETY SYSTEMS

- Manual lowering device & emergency battery lowering
- Slack chain safety switch
- Final limit switch

HYDRAULIC DRIVE



SUITABLE APPLICATION

- Best for homes with more generous footprints, as a machine room or dedicated closet is required
- A great option when quiet operation is a priority, with mechanical components housed at the lowest level for reduced noise throughout the home

EQUIPMENT

- 220 VAC, 60Hz, 30 Amp single-phase power
- 2:1 roped hydraulic single stage cylinder
- Submersed electric motor with 2-speed adjustable valve system
- Two ⅜" diameter, 17 x 9 wire ropes

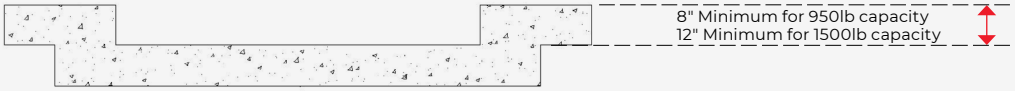
SAFETY SYSTEMS

- Manual lowering device & emergency battery lowering
- Slack rope safety switch
- Final limit switch

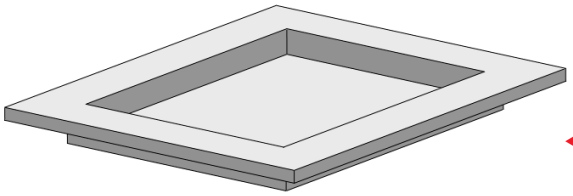
Hoistway Construction

Pit Construction

PIT DEPTH

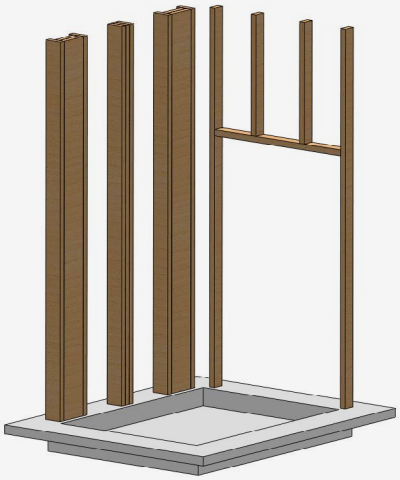


PIT FLOOR

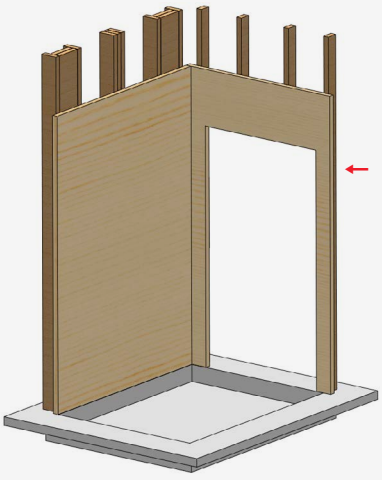


- **Pit floor** to be designed for an impact load of 9600 lbs. and static load of 5500 lbs. reinforcing as per local construction codes.
- **NOTE:** The pit must remain completely dry at all times without the use of drainage systems of sump pumps.

FINISHED HOISTWAY



FINISHED HOISTWAY WITH WALLS

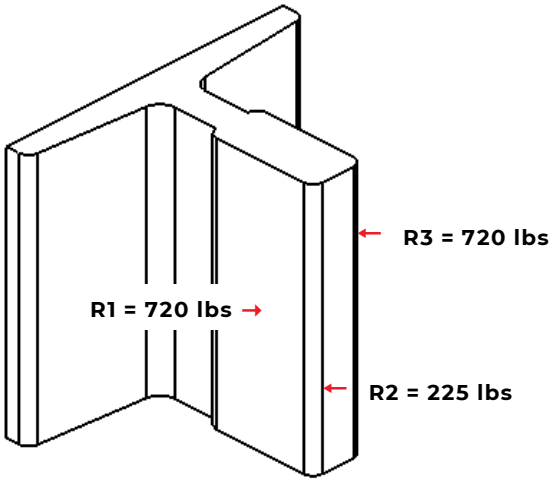


- All finished interior hoistway walls to be flush to pit walls. **DO NOT** set on pit floor.

Hoistway Structural Requirements

Please refer to a Structural Engineer to verify all structural requirements. A structural engineer must ensure that the building and hoistway can safely support all loads imposed by the elevator equipment.

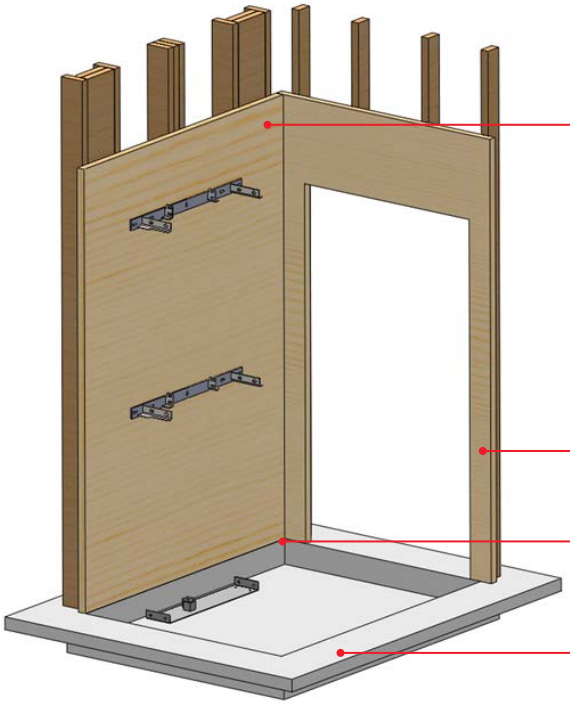
T-RAIL LOAD BEARING WALL



- A load-bearing wall is required to sustain rail reactions.
- Hoistway must be in accordance with ASME A17.1-2022/CSA B44:22, AND all local codes and regulations.
- Due to limited clearances, it is necessary that hoistway walls be square and plumb. Maximum permissible deviation from hoistway top to bottom is ¼".
- Building structure must sustain a chain hoist for hoisting elevator materials to the top of the hoistway during installation.

Rail Wall Construction (Wood, Stud, or Concrete)

FULL RAIL WALL ASSEMBLY



Rail wall sheathing requires ¾" plywood screwed to studs every 12" with #10-2½" screws minimum

For best results use a construction adhesive in addition to required wood screws

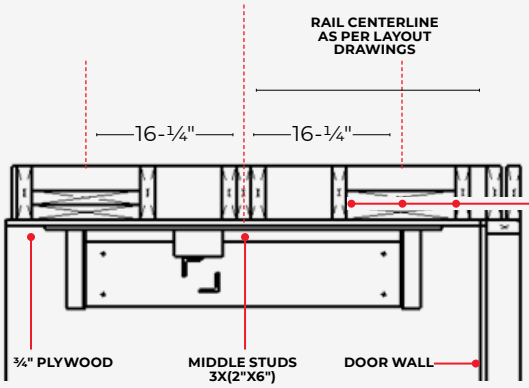
All other walls as per local building code requirements

Walls with door openings must have 2"x4" stud construction

Surface of plywood flush with pit wall

Bottom floor slab

CHANNEL ASSEMBLY TOP VIEW



Requires 2 channels full height of hoistway

Two 2"x12" inside two 2"x6"

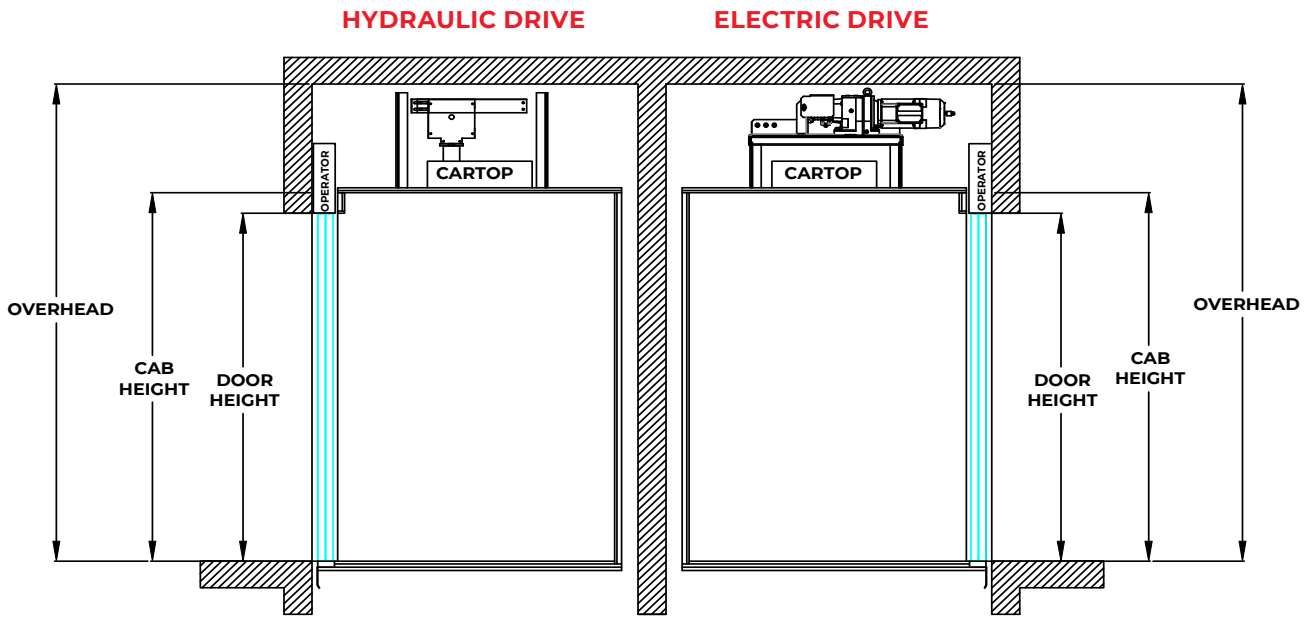
2x6's screwed to 2x12's every 6" with #10x31½" wood screws

Channels and middle studs between floors full height of hoistway

NOTE: If you require a mini sling as per your standard drawings package, the rail wall channel assembly will be 13-1/4" instead of 16-1/4"

DISCLAIMER: The drawings contained herein have been prepared using engineering principles and the design loads that are applied by the rails to the wall. However, the details and member sizes and attachments to the structure should not be construed as a complete wall system. The contractor and/or the project engineer are responsible to evaluate the other loads that are applied to the wall from the floor or roof system and modify sizes or connections as required by their analysis.

Overhead Clearance by Model



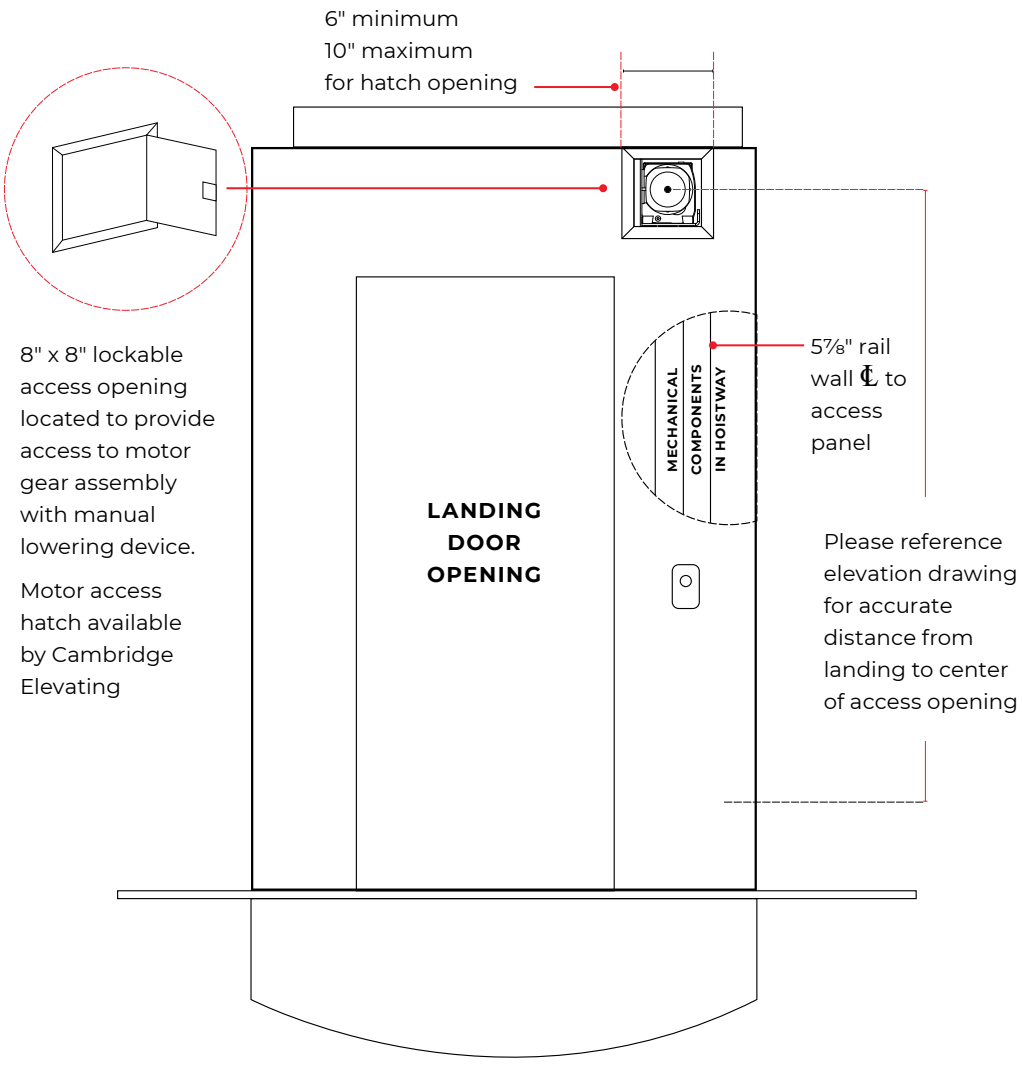
NOTE: Overhead clearance is highly dependent on cab door heights and model selected

OVERHEAD REQUIREMENTS

System Type	Hydraulic Drive System		Electric Drive System	
Model	Elmira	Heritage / Cambrian	Elmira	Heritage / Cambrian
84" Cab Height	96"	108"	96" - 108"	108"
96" Cab Height	108"	120"	108" - 120"	120"
NOTE	Minimum overhead may decrease depending on door height selected for Heritage and Cambrian models		Minimum overhead may increase if the electric motor interferes with cab entrance components	

Electric Motor Access Hatch

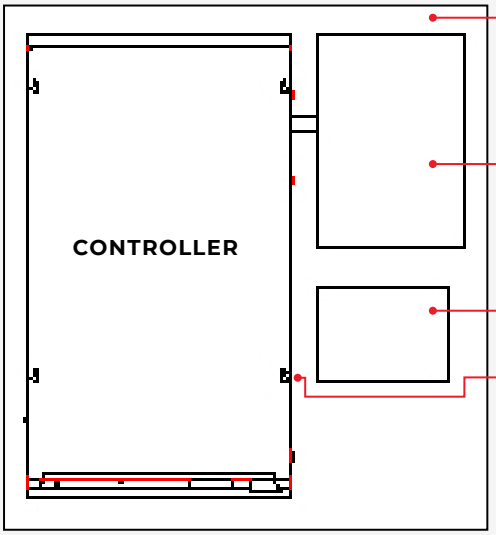
This diagram illustrates the electric motor access hatch for a home elevator (with an electric drive), which is a dedicated opening that allows technicians to reach the elevator's drive motor and associated equipment. The hatch's location, size, and clearance are shown to clarify how safe access is provided for inspection, maintenance, and servicing.



Mechanical + Electrical

Electric Controller

FRONT VIEW



¾" Plywood backer
H: 32" | D: 7¼" | W: 32"

240 VAC, 30amp disconnect
(reference table below)

120 VAC, 15amp lighting disconnect

Telephone line connection for
elevator inside controller

ELECTRICAL REQUIREMENTS

LOAD TYPE	PHASE	VOLTAGE	CIRCUIT CURRENT	FUSE RATED	FIELD PREP.
2HP Motor Power	1	220 VAC	12.0A	20A	Indoor. Fusible 3 Pole 240 VAC, 30A , Type 1

LIGHTING REQUIREMENTS

LOAD TYPE	PHASE	VOLTAGE	CIRCUIT CURRENT	FUSE RATED	FIELD PREP.
Lighting Type	1	120 VAC	0.8A	15A	120 VAC, 15A, 1PH, Type 1

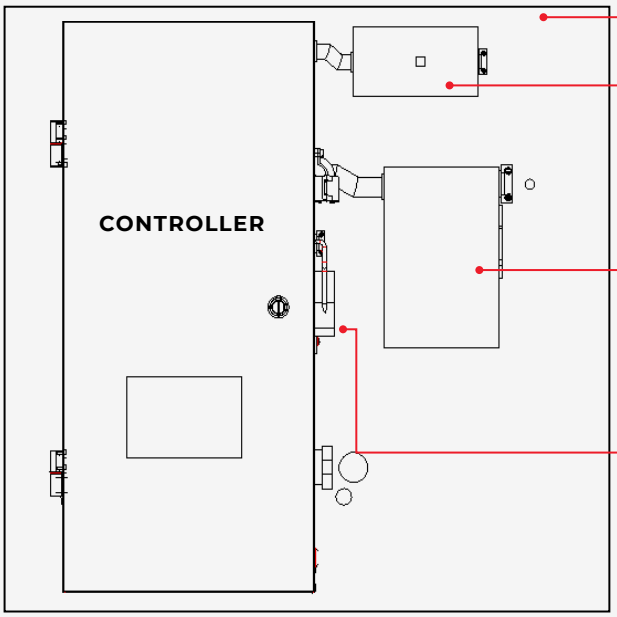
NOTE: A dedicated machine room is recommended but not required in all jurisdictions. Where it is required, the elevator machine room location and layout must meet the code requirements defined by the local authority.

NOTE: The machine room is to be located within 20 feet of the elevator hoistway. For longer distances, consult Cambridge Elevating.

Mechanical + Electrical

Hydraulic Controller

FRONT VIEW



¾" Plywood backer
H: 30½" | D: 8½" | W: 28"

120 VAC, 15amp lighting disconnect

240 VAC, 30amp disconnect (reference table below)

Telephone line connection for elevator inside controller

ELECTRICAL REQUIREMENTS

MOTOR POWER	PHASE	VOLTAGE	CIRCUIT CURRENT	FIELD PREPARATION
3 + 5HP	1	240 VAC	30A	NEMA 14-30 outlet or hardwire
3 + 5HP	3	208 VAC	30A	Hardwire
10HP	1	220 VAC	60A minimum	Hardwire
10HP	3	208 VAC	40A	Hardwire

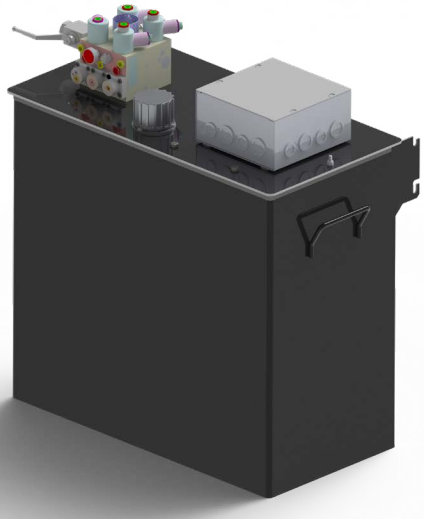
LIGHTING REQUIREMENTS

LOAD TYPE	PHASE	VOLTAGE	CIRCUIT CURRENT	FUSE RATED	FIELD PREP.
Lighting Type	1	120 VAC	0.8A	15A	120 VAC, 15A, 1PH, Type 1

Mechanical + Electrical

HYDRAULIC POWER UNIT STANDARD

DIMENSIONS:
H:31" | D: 14" | W: 30¼"



HYDRAULIC POWER UNIT MACHINE ROOM-LESS

DIMENSIONS:

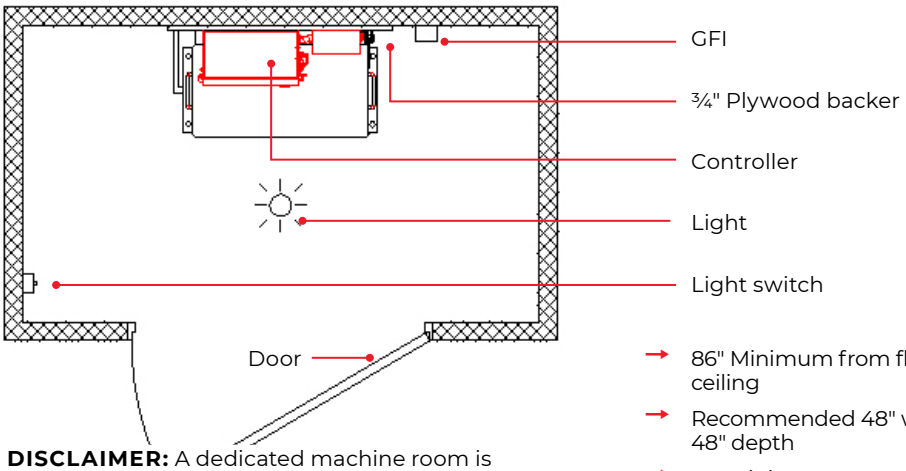
H: 47½" | D: 10½" | W: 12"

Requires 21"H backboard for total height of 68½"

NOTE: The MRL power unit needs 36" clearance from front of tank to floor



HYDRAULIC CONTROL ROOM



- 86" Minimum from floor to ceiling
- Recommended 48" width and 48" depth
- 36" Minimum as per N.E.C. & 1 meter minimum. As per C.E.C. Space required in front of control panel
- Controller usually mounted in machine room on wall within 6' of power unit

DISCLAIMER: A dedicated machine room is recommended but not required in all jurisdictions. Where it is required, the elevator machine room location and layout must meet the code requirements defined by the local authority having jurisdiction. Machine room to be located within 20 feet of elevator hoistway. For longer distances, consult Cambridge Elevating.

Finishing Contractors

Understanding the ¾” x 4” Code Requirement

By nature of home elevators using a standard residential swing door at each landing, there exists a space (or gap) between this hoistway door and the elevator car gate/door large enough for a child to enter a potentially unsafe scenario which could result in serious injury or death.

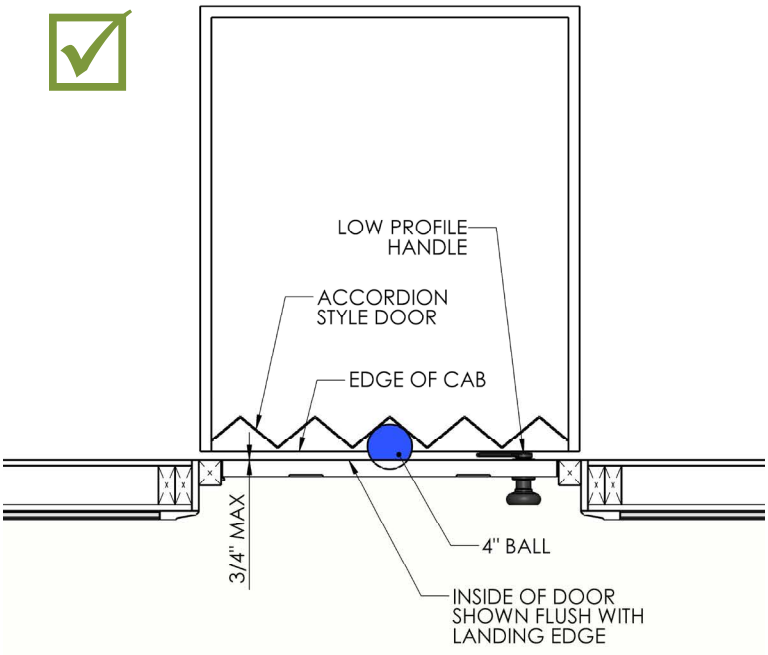
All Cambridge Elevating residential elevator models are equipped with a safety light curtain as standard. While this greatly improves safety, only the onsite building contractor is in control of the final location of the swing hoistway door to minimize the gap mentioned above.

The installation must comply with ASME A17.1 / CSA B44 Safety Code for Elevators and Escalators (Section 5.3), which mandates the following:

- Clearance between the hoistway door and the hoistway edge must not exceed ¾ inches
- Clearance between the hoistway door and car door must not exceed 4 inches

The two illustrations below demonstrate how a 4" diameter ball is used to verify compliance.

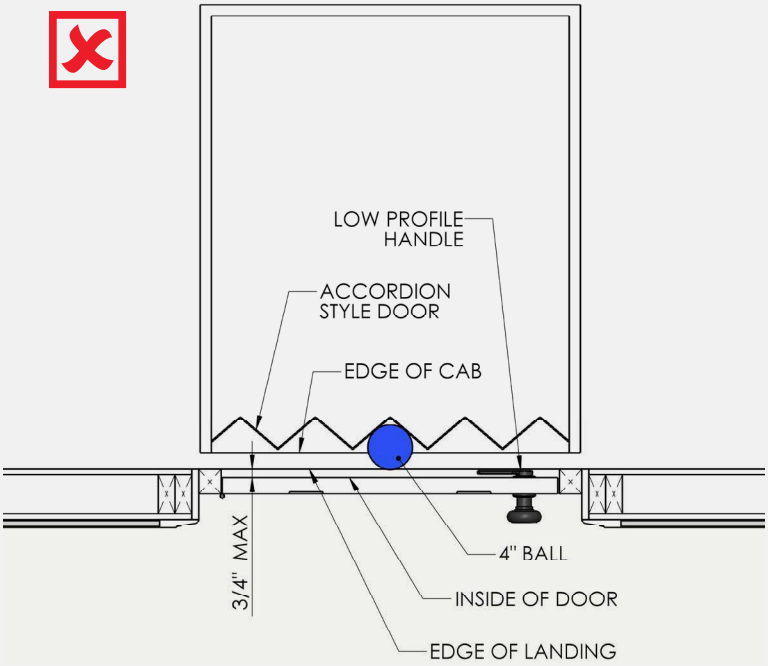
PASSED 4" BALL TEST



PLEASE NOTE:

Due to the peak and valley design of accordion gates, the landing door must be flush to reject the 4" ball.

FAILED 4" BALL TEST



If the installation does not meet these requirements, it may result in failed inspections, delays in project completion, and the need for corrective work such as door repositioning or the addition of a costly space guard.

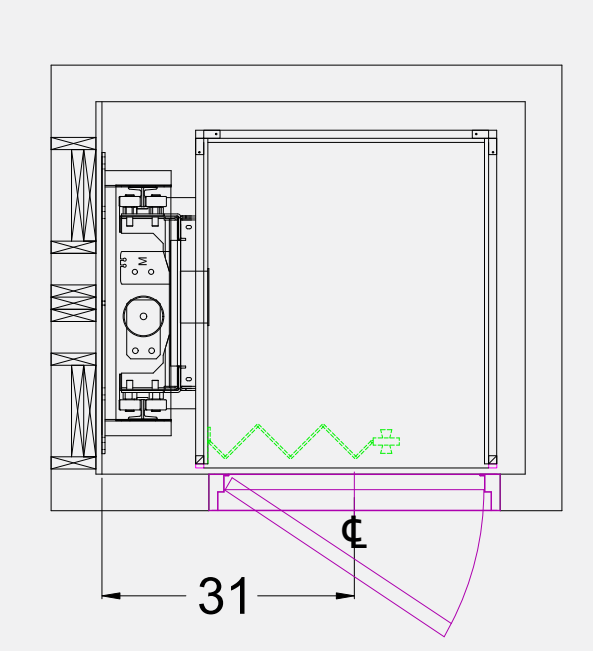
These Standards have been adopted by most states and are enforced by the local Authority Having Jurisdiction (AHJ). It is important to note, not all states have adopted the same year of the A17.1 /CSA B44 standard and some states have not adopted any version. It is strongly recommended by Cambridge Elevating that all contractors comply with the latest code requirements (2016 and later) to minimize the gap and maximize safety of the elevator installation.

IMPORTANT IMPLICATIONS – DOOR PLACEMENT BY CAB DOOR TYPE

The exact landing door position depends on the Cab Door System specified for the project and the Door Centerline detailed in the Final Drawing Package.

STEP 1
CONFIRM THE DOOR CENTERLINE

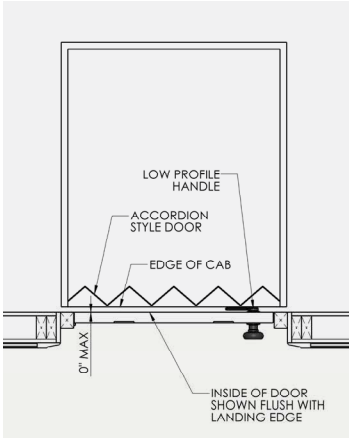
→ Provide a Rough Opening of door width plus 4 inches per the Final Drawing's Door Centerline



STEP 2
CONFIRM THE CAB DOOR SYSTEM

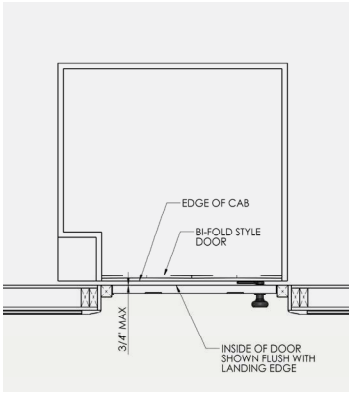
Elmira Model with Accordion Gate

- Position the swing landing door flush to hoistway edge given the collapsible gate design.



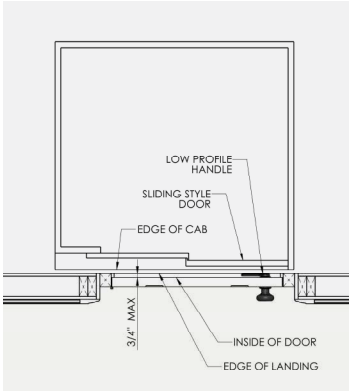
Elmira Model with Bi-Fold Gate

- Position the swing landing door up to ¾" maximum from the hoistway edge.



Heritage Model with Sliding Cab Door Panels

- Position the swing landing door up to ¾" maximum from the hoistway edge.



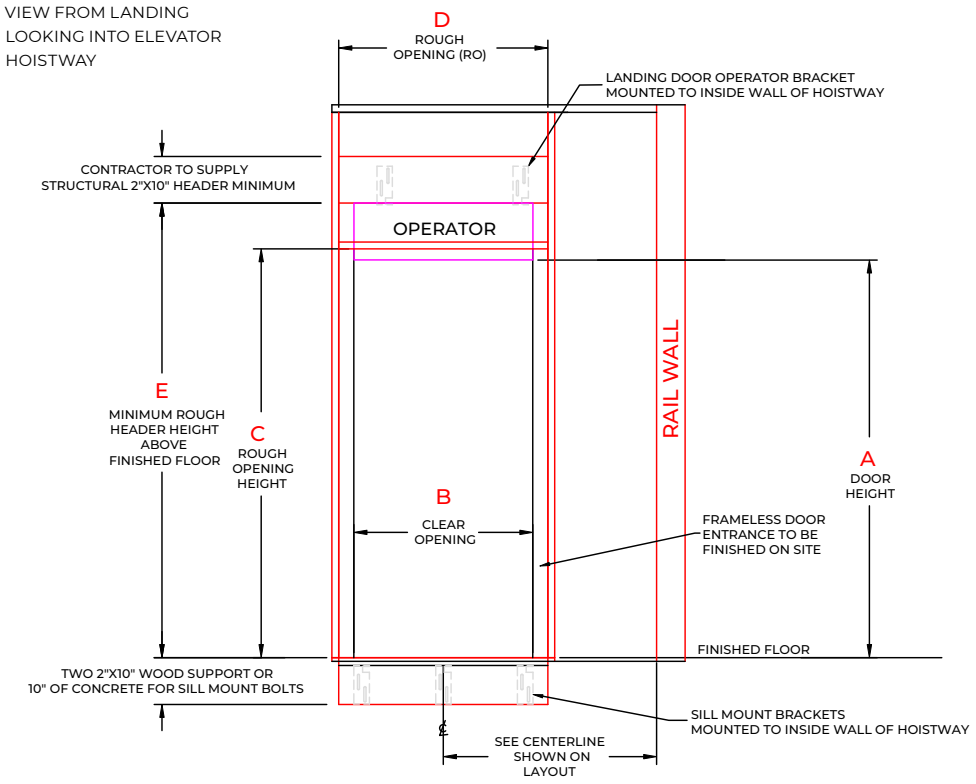
FOR BEST RESULTS:

- Use recessed pull hardware on the elevator side of the swing landing door.
- Use swing clear offset door hinges to allow maximum door swing.

Cambrian Model (Sliding Cab & Landing Door Panels)

- There isn't a door gap safety risk when both the cab and landing door panels open and close together.
- Refer to the following drawings to establish the landing door rough opening.

AUTOMATIC LANDING DOOR SYSTEM ROUGH OPENING - FRAMELESS



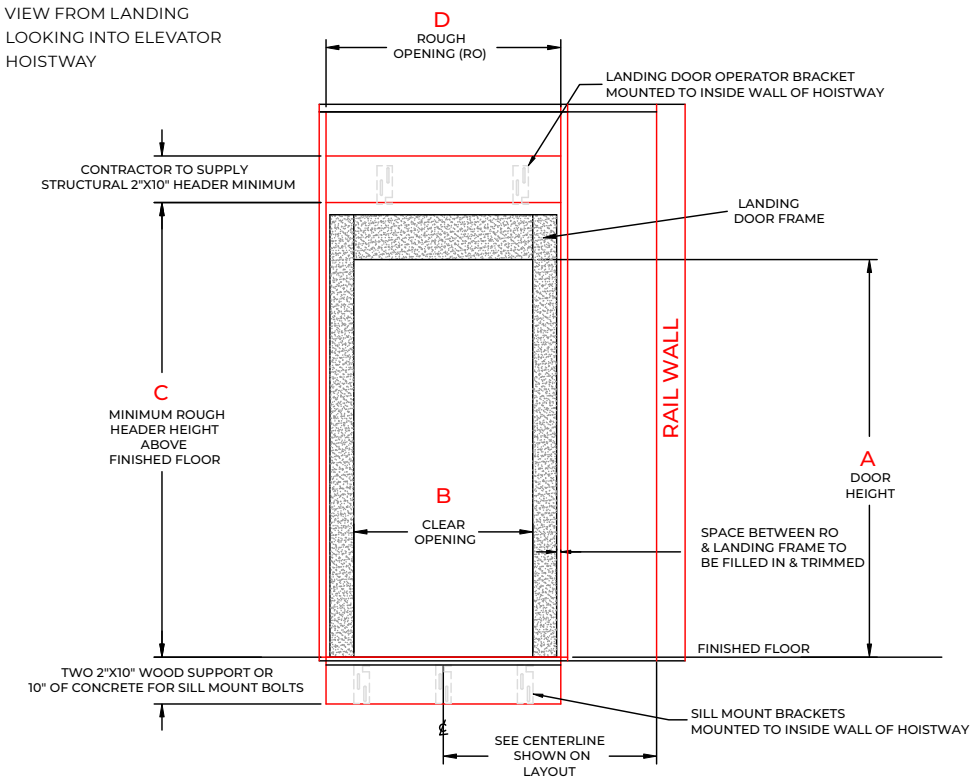
Framing Information (Refer to layout drawing for door height & opening width)

Door Panels	Door Height	Clear Opening	Rough Opening Height	Rough Opening (RO)	Header Height
	A	B	C	D	E
3	78-¾"	31-½"	90-¾"	36"	90"
	84"		86"		96-¼"
	94-⅞"		96-⅞"		106"
2 or 3	78-¾"	36-½"	90-¾"	40"	90"
	84"		86"		96-¼"
	94-⅞"		96-⅞"		106"

PLEASE NOTE:

It is the recommendation of Cambridge Elevating to leave doors wide open for installation

AUTOMATIC LANDING DOOR SYSTEM ROUGH OPENING - FRAMED



Framing Information (Refer to layout drawing for door height & opening width)				
Door Panels	Door Height	Clear Opening	Rough Opening Height	Rough Opening (RO)
	A	B	C	D
3	78-¾"	31-7⁄16"	90"	42"
2 or 3	78-¾"	35-7⁄16"	90"	46"
2	94-⅞"	35-7⁄16"	106"	46"

Landing Frame Information		
Vertical Width	Header Height	Overall Landing Width
4-¾"	8-⅞"	Clear Opening 9-½"

PLEASE NOTE:

It is the recommendation of Cambridge Elevating to leave doors wide open for installation

The Cambrian Finishing Requirements

There are two landing options available: Framed or Frameless. This refers to whether a frame surrounds the landing doors. Both options ensure safety while providing a finished look that complements the home.

FRAMED LANDINGS

Framed Cambrian landings require the surrounding frame to be enclosed with finished wall material. The enclosure should:

- Match the home's interior style.
- Prevent any openings large enough for hands to fit through, ensuring safety.

EXAMPLE: The images below show a Cambrian elevator before and after the frames were installed.

BEFORE FRAMES INSTALLED



AFTER FRAMES INSTALLED



FRAMELESS LANDINGS

Frameless Cambrian landings follow a slightly different approach:

STEP 1:
Enclose all areas around the elevator landings using finished wall materials that match your home's interior. Ensure the enclosures eliminate any openings large enough for hands to fit through.

STEP 2:
In the jog piece above each door, provide an access hole for the safety lever. The recommended size for this hole is 3" long x 1" wide.

BEFORE JOG PIECE INSTALL



SAFETY LEVEL ACCESS HOLE

AFTER JOG PIECE INSTALL



Pre-Installation Checklist

HOISTWAY

- [ ] The shaft is square and plumb
- [ ] Confirm that the finished shaft length and width match the final drawings provided
- [ ] Confirm number of floors served
- [ ] Ensure rail wall built to specifications
- [ ] Make sure support dimensions are the same as bracket spacing on drawings
- [ ] The pit floor must be smooth and level for the baseplate to sit
- [ ] Confirm: pit dimension, floor-to-floor dimension and total travel dimension
- [ ] Check overhead
- [ ] Ensure no other equipment or piping is in the shaft, unless it pertains to the elevator
- [ ] The pit should be free of debris and water

MACHINE ROOM

- [ ] Confirm power to the breaker(s) are live (refer to drawing)
- [ ] Ensure that there is a minimum clearance of 3'-3" in front of any live circuits, as well as a minimum. clearance height of 7', or as per any Local Codes
- [ ] Confirm power to the breaker is live (220 V - single phase, or as per drawing, 120V for lighting)

FOR MORE INFORMATION PLEASE CONTACT:

Cambridge Elevating

1.800.265.3579

cambridgeelevating.com