Design & Planning Guide

WHEN LUXURY MEETS CONVENIENCE

VEARS



Purpose

This guide is intended to assist architects, contractors, and elevator professionals to incorporate an AHE home elevator into a residential building design. All AHE home elevators must meet the applicable requirements of ASME A17.1 section 5.3 Safety Code for Elevators and Escalators.

While this guide provides all necessary information, we highly recommend contacting your local elevator installation company prior to the start of construction. To locate your nearest dealer please visit <u>WWW.ACCELEVATOR. COM</u> or call us at 1 (800) 488-5905.

Specification type	Hydraulic	Counterweight		
Load Capacity	950 lbs.	950 lbs.		
Rated Speed	40 FPM	40 FPM		
Power supply (circuit supplied by others)	220V Single Phase 30 Amp 10/3 Wire	220V Single Phase 30 Amp 10/3 Wire		
Lighting Supply (circuit supplied by others)	120V 15 Amp 14/2 Wire	120V 15 Amp 14/2 Wire		
Drive system	1:2 roped hydraulic with submersed power unit	2HP geared 3 phase inverter duty motor with 60lb roller chain and variable frequency drive		
Maximum Travel	50 Feet	50 Feet		
Control System	Microprocessor based controller with led diagnostics	Microprocessor based controller with led diagnostics		
Levels and openings	Up to 6 stops / up to 2 openings	Up to 6 stops / up to 2 openings		
Pit depth	Minimum 9.00"	Minimum 9.00"		
Overhead	96" for standard 7'0" cab.	96" for standard 7'0" cab.		
Cab size	Dependent upon hoist-way size. Not to exceed 15 Square feet.	Dependent upon hoist-way size. Not to exceed 15 Square feet.		
Standard features	 Recessed gate pocket. 2 speed valve for soft start and stop. Submersed pump and motor Automatic cab lighting. Car here lights at all hall stations. Auto homing feature. Unfinished plywood flooring. Hardwood veneer cab. Accordion Gate(s). 	 Recessed gate pocket. Variable frequency inverter drive for smooth start stop and leveling. Motor at top of rails for reduced machine space. Automatic cab lighting. Car here lights at all hall stations. Auto homing feature. Unfinished plywood flooring Hardwood veneer cab. Accordion Gate(s). 		
Safety features	 Type A instantaneous safeties. Manually reset slack rope switch. Pipe rupture valve. Low pressure switch. Positively open gate safety switch. Upper and lower limits. Emergency stop and Alarm. Pit and car top stop switches. 	 Type A instantaneous safeties. Manually reset slack chain switch. Drive overload circuit. Positively open gate safety switch. Upper, lower, and final limits. Emergency stop and Alarm. Pit and car top stop switches. 		

Typical Hoistway Layouts

All dimensions listed are finished hoist way dimensions from the inside of the drywall. Any changes made to the door swings may affect the required hoist way dimensions. Please contact your local project manager for custom car sizes and layout.





Cab Size	Cab Dimensions	Finished Width	Finished Depth	Center of Rail
12 Sq ft	36" x 48"	56"	56"	28"
15 Sq ft	36" x 60"	56"	68"	28"
14 Sq ft	42" x 48"	62"	56"	31"
15 Sq ft	40" x 54"	60"	62"	30"



Cab Size	Cab Dimensions	Finished Width	Finished Depth	Center of Rail
12 Sq ft	36" x 48"	56"	56"	28"
15 Sq ft	36" x 60"	56"	66"	28"
14 Sq ft	42" x 48"	62"	54"	31"
15 Sq ft	40" x 54"	60"	60"	30"

Typical Hoistway Layouts (continued)



Cab Size	Cab Dimensions	Finished Width	Finished Depth	Center of Rail
13½ Sq ft	40" x 48"	50"	64 1⁄2"	25"
14 Sq ft	42" x 48"	52"	64 1⁄2"	26"

FINISHED DEPTH



Cab Size	Cab Dimensions	Finished Width	Finished Depth	Center of Rail
13½ Sq ft	40" x 48"	56 ½"	56 ½"	28 ¼"
14 Sq ft	42" x 48"	58 ½"	56 ½"	29 ¼"
15 Sq ft	40" x 54"	56 ½"	62"	28 ¼"

Pit Construction

The elevator hoist way shall have a pit at the lower most landing to accept the elevator machinery and allow the cab sill to be flush with the finished floor.



Framing

The Elevator hoist way is to be constructed in accordance with ANSI A17.1 and all local codes. No items not directly involved with the function of the elevator are allowed in the hoist way.

- Hoist way framework must be plumb & square within ½" over the entire rise.
- Hoist way must be sheet rocked, taped & spackled.



Rail Backing

The spacing of the rail backers differ from one machine to the next. When designing and constructing your rail backing, the wall supports must withstand the rail forces as described below.

Hydraulic



Counterweight





RAIL REACTIONS (PER RAIL) 950 lbs. F1 = 188F2 = 377

Rail Backing (continued)

- Each Rail Backer is to be; (2) Sets of Double 2 x12's boxed in between (2) 2 x4's. with staggering joints. They are to be glued and
- screwed the entire run of the hoist way from the pit to the ceiling.
- Each Rail Backer is to be securely fastened at all intermediate floors with vertical intervals NOT exceeding 10ft without being secured.

The elevator Rail Brackets are fastened to the Rail Backers using (4) $\frac{1}{2} \times \frac{31}{2}$ "lg. Lag Bolts



Dim

Rail Backing (continued)







- MUST NOT HAVE ANY CONSTRUCTION ENCROACHMENTS IN THE HOIST WAY
- NO EQUIPMENT NOT RELATED TO THE ELEVATOR SHALL BE IN THE HOIST WAY
- BARRICADES MUST BE • PROVIDED BY CONTRACTOR PER OSHA REQUIREMENTS FOR EACH **DOOR OPENING Finished Floor** Transitions at all floors are to be Flush 44032 Concrete Floor Concrete & Masonry Must Be Flush with pit. たいたいで 彩漆

Overhead: Manual & Automatic Accordion Gates

The overhead is to be measured from the finished flooring at the uppermost landing to the lowest obstruction at the top of the hoist way.



Plumbing Hoistway Doors

- For jurisdictions enforcing ASME A17.1 2016 and later, Doors must be 1³/₄", Solid Core set on flush mount elevator jambs. See your elevator contractor for more detail.
- All doors must be installed inline and plumb with one another at each floor.



Hoistway Doors - 3/4 x 4 Rule (ASME 17.1 2016 AND LATER)



As stated per ASME A17.1 2016 AND LATER

- The clearance between the face of the 1³/₄" solid core door from inside the hoist way to the hoist way sill cannot exceed more than 3/4 inches.
- The clearance between the face of the 1³/₄" solid core door from inside the hoist way to the outside face of the gate on the elevator cannot exceed more than 4 inches.

- Doors must be hung flush with the inside hoist way drywall leaving maximum ³/₄"from closed door to inside edge of sill/drywall.
- Inner Hoist way door casing/trim is not to be applied until after the elevator device is installed.



• Clearance between landing floor and underside of hoist way door must not exceed 3/8"

IMPORTANT NOTE: Please see your local elevator company about which codes are enforced in your jurisdiction.



Door Lock Setback Kits

Door Height	A
80"	2"
84"	5"
96"	17"





3 Speed Side Slide Door Typical Hoistway Layouts





Cab Size	Cab Dimensions	Finished Width	Finished Depth	Center of Rail
12 Sq ft	36" x 48"	56"	65"	32 1⁄2"
14 Sq ft	42" x 48"	61"	65"	32 1⁄2"
15 Sq ft	40" x 54"	59"	71"	35 ½"



Cab Size	Car Size	Finished Width	Finished Depth	Center of Rail
12 Sq ft	36" x 48"	56"	72¾"	36¾"
14 Sq ft	42" x 48"	61"	71¾"	35%"

3 Speed Side Slide Door Typical Hoistway Layouts (continued)



Cab Size	Cab Dimensions	Finished Width	Finished Depth	Center of Rail
14 Sq ft	42" x 48"	52¼"	73¼"	261⁄8"
15 Sq ft	54" x 40"	65"	65¼"	32½"





Cab Size	Cab Dimensions	Finished Width	Finished Depth	Center of Rail
13½ Sq ft	40" x 48"	65"	65"	32 1⁄2"
14 Sq ft	42" x 48"	67¼"	65"	32 1⁄2"
15 Sq ft	40" x 54"	65¼"	71"	35 ½"

2 Speed Side Slide Door Typical Hoistway Layouts



Cab Size	Cab Dimensions	Finished Width	Finished Depth	Center of Rail
14½ Sq ft	43" x 48"	64"	62½"	31¼"



Cab Size	Cab Dimensions	Finished Width	Finished Depth	Center of Rail
121⁄2	36" x 50"	62 ½"	57¾"	31¼"
14¾	42" x 50"	62½"	63¾"	31¼"
15	40" x 54"	64"	61¾"	32"

2 Speed Side Slide Door Typical Hoistway Layouts (continued)



Cab Size	Cab Dimensions	Finished Width	Finished Depth	Center of Rail
14½ Sq ft	43" x 48"	62¾"	64¾"	32¾"

2 & 3 Speed Side Slide Door Framing and Overhead

To achieve the side slide finished door offset dimensions as prescribed by AHE, each wall of the hoist way receiving the side slide door must be left completely open and unframed. Once the doors are installed by AHE, the final construction can then be completed.

Counterweight





Hydraulic



Side Slide Overhead

The elevator shall be constructed so there are no interferences with the machinery and the gate operator. The motor must be accessible from the outside of the hoist way without any obstructions. For the overheads represented below, reference the **Finished Width** and **Depth** dimensions listed in the *Side Slide Typical Hoist Way Layout* section. When planning your project, consult with an **Accredited Home Elevator Project Manager**.



2 Speed Side Slide Landing Frames



Door Height	A	В
80"	78 3/4"	87"
84"	84 5/8"	927/8"
96"	94 1/2"	102 3/4"



Landing Frames & Sill Supports



Machine Rooms

Elevator Machine rooms must meet all local, state, and national codes including all NEC requirements.

Electrical Requirements (See pg. 28)

- 220v 30A dedicated line 10/3 wire
- 110v 15A dedicated line 14/2 wire
- Telephone connection.

Machine Space as per NEC

- A 36" ceiling run at a minimum height of 6'-6" must be maintained above the controller. (See pg. 31)
- As per NEC requirements, a minimum of 36" of clearance must be maintained in front of elevator controls and all electrical connections. (*See pg. 29*)
- A 30" minimum clearance between the controller and the wall is required. (See pg. 30)

Typical Hydraulic Elevator Machine Room



Machine Rooms (continued)

Compact Hydraulic Elevator Machine Room



Typical Counterweight Elevator Machine Room



Machine Room Wiring



Counterweight Machine Room

Hydraulic Machine Room





Machine Room Clearances

Counterweight Machine Room Clearances

Hydraulic Machine Room Clearances



Typical Machine Room Layout

Alternate Machine Room Layout



Equipment Dimensions







A.H.E. HOME ELEVATOR MANUFACTURING.

Residential Elevator

Technical Specifications

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Residential elevator with 1:2 roped hydraulic lift system.
- B. 1:1 Geared Counterweighted system.

1.02 WORK INCLUDED

A. Furnish all labor and materials, equipment, and incidentals necessary to assemble and erect a residential elevator, complete with a remote power unit /motor, rails, brackets, connections, and controls essential for proper operation.

1.03 WORK BY OTHERS

- A. Construct a Hoist-way of the size required by the manufacturer, complete with all demolition, additional framing, headers, and framing components necessary to prepare the building to receive the elevator.
 - 1. Hoist-way size: Dependent upon car size.
 - 2. The hoist-way shall be vertical to within 1/2'' throughout the entire height.
 - 3. Provide and fasten vertical structural members in hoist-way, per manufacture's recommendation.
 - 4. Pit requirements: Provide 9" deep pit Install reinforcement and concrete as necessary. The floor must sustain load specified in job drawings.
- B. Construct a machine room:
 - Provide dedicated elevator electrical circuit: 240-volt AC/ 1 phase/ 60hz (30 amp) 10/3 Wire.
 - 2. Provide dedicated elevator lighting circuit: 115 volt (15amp)
- C. Provide system to maintain hoist-way and machine room temperature between 50-90 degrees Fahrenheit.
- D. Provide and maintain OSHA compliant hoist-way barricades.
- E. Provide specified opening for manual lowering access door.

1.04 REFERENCES:

- A. General: The applicable provisions of the following standards shall apply as if written here in their entirety.
- B. American Society of Mechanical Engineers / American National Standards Institute (ASME/ANSI) publications: ASME/ANSI A17.1 "Safety Codes for Elevators and Escalators", Section 5.3.
- C. National Fire Protection Association (NFPA) publications: NFPA 70 National Electrical Code

1.05 SYSTEM DESCRIPTION:

- A. Travel: _____
- B. Stops:
- C. Load Capacity: 950 lb.
- D. Speed: 40 fpm
- E. Configuration_

1.06 QUALITY ASSURANCE

A. Qualifications:

Installer Qualifications: A company experienced in the assembly and erection of lifts and residential elevators of the type specified.

Manufacturer Qualifications: A company specializing in the manufacture of residential elevators.

B. Regulatory Requirements: The complete manufacture, fabrication and erecting of the elevator shall comply with all Federal, State, and local codes and ordinances. The installer shall verify requirements of the local authority having jurisdiction and shall comply with all local codes and ordinances.

1.07 DELIVERY, HANDLING & STORAGE

A. All components shall be shipped to the site in substantial crates to protect from damage during shipping and handling. Upon arrival, inspect components and keep under cover until installed.

1.08 WARRANTY

A. Unit shall have a two (1) year limited parts warranty.

1.09 MAINTENANCE:

- A. Maintenance of the private residential elevator shall consist of regular cleaning and inspection at intervals not longer than every 12 months.
- B. Inspection: ASME A17.1 requires all private residential elevators to be inspected every 12 months.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. A.H.E. Home Elevators
- B. Substitutions: No substitution shall be considered unless a written request for approval has been submitted and received by the architect at least ten (10) days prior to the bid date.

2.02 COMPONENTS

A. Car:

- 1. Size: Dependent upon shaft size. Car dim not to exceed 15 Ft/SQ
- Enclosure: Securely fastened to the car frame and platform. The car shall be constructed of minimum ³/₄" wood walls. Floorboard shall be constructed of ³/₄" AC plywood.
- 3. Gate: equipped with a positively opened mechanical switch to indicate that the door is closed.
- 4. Handrail: One located on the car wall.
- 5. Telephone: integrated in COP

- 6. Control panel: Provide one momentary pressure illuminated button for each landing, emergency stop, and alarm button all mounted in a control panel having a stainless steel or brass cover.
- 7. Interior lighting: Provide overhead light fixtures that automatically turn on when the car is in operation and turn off by means of a timer circuit.
- B. Hoist-way door:
 - 1. Size: 3'0" W x 6'8"H swing Type (by Others)
 - 2. The general contractor or owner is to furnish and install hoistway doors, frames, hinges, and passage sets at each landing. The type and installation of the doors and frames must comply with ASME A17.1, all local codes and manufacturer's layout drawings.
 - 3. Locking Device: Door shall have a locking device, interlocked with the car operation, to interrupt electrical power when the door is not securely closed, and a car is not at the landing. The door shall be locked when the car is not in the landing zone.

HYDRAULIC SYSTEM

- C. Hydraulic power unit:
 - 1. The pump, motor and valve shall be pre-wired, ready for connection to the controller in the field.
 - 2. Up direction acceleration adjustment.
 - 3. Two speed operation.
 - 4. Adjustable pressure relief valves.
 - 5. Manually operated down valve for emergency operation.
 - 6. Pressure gauges and pressure gauge isolation valves.
 - 7. Manual valve isolation between pump unit and jack.
 - 8. Negative pressure switch provided.
- D. Cylinder:
 - 1. Construction: Steel pipe with cylinder head having an internal guide ring and self-adjusting packing.
 - 2. Safety valve: Cylinder shall be equipped with a pipe rupture safety valve to prevent uncontrolled car descent.
- E. Plunger:
 - 1. Construction: Shall be a machined steel shaft equipped with a stop, electrically welded to bottom end, to prevent plunger from leaving shaft cylinder.
- F. Suspension system: 1:2 system using (2) 3/8'' 7x19 aircraft cables integrated with ram's header sheave mounted to the plunger.
- G. Guide rail: Shall consist of two 8 lb. tee rails assembled and fastened. Provide brackets to hold rail assembly to walls. The rail shall be furnished with steel splice plates and hardware.

ELECTRIC COUNTERWEIGHT SYSTEM

- H. Inline Gear Drive with 2HP 3 Phase Motor
 - 9. The Motor and drive shall be pre-wired, ready for connection to the controller in the field.
 - 10. Up/down direction acceleration/deceleration adjustment.
 - 11. Variable Frequency leveling and speed control. I. Suspension system: 1:1 system using (2) RS60 drive chain.
- J. Guide rail: Shall consist of (4) 6 lb. tee rails assembled and fastened. Provide brackets to hold rail assembly to walls. The rail shall be furnished with steel splice plates and hardware.

HYDRAULIC & COUNTERWEIGHT SYSTEMS

- K.Car frame: Shall be equipped with non-metallic faced roller guide wheels.
- L. Leveling device: Provide Position Sensor to maintain car within 1/2'' of the landing.
- M. Control systems: non-Selective collective microprocessor
- N. Wiring:
 - 1. Provide flexible traveling cable for electrical lights and controls in car.
 - 2. All other electrical wiring shall be insulated, flame retardant and moisture proof copper wiring, installed in flexible metal conduit.
- O. Safety Devices:
 - 1. Slack cable protection: Provide a linkage device that stops and sustains the car in the event of breakage or slackening of cables.
 - 2. Terminal stopping device: Shall be provided at the top and bottom of the car travel.
 - 3. Provide a platform toe guard at the car entrance.
- P. Optional Battery powered emergency operation system:
 - 1. Powers a light in the car.
 - 2. Powers an emergency alarm system.
 - 3. Powers a system to allow the car to descend to the floor selected by passenger.
 - 4. The batteries shall be of a re-chargeable type complete with an automatic re-charging system.

PART 3 EXECUTION

3.01 INSTALLATION

A. Inspect the hoist-way and determine if the hoist-way meets the manufacturer's requirements for clearances and plumb.

B. All components shall be assembled and erected in strict compliance with the manufacturer's printed instructions and applicable codes.

C. All wiring shall be in accordance with the wiring diagram furnished by the manufacturer and NEC.

3.02 FIELD QUALITY CONTROL

A. Static/Running Load Test: All load rating and safety factors shall meet or exceed those specified in ASME A17.1

3.03 ADJUSTING

A. Test the elevator to ensure proper operation under all conditions of use. Make proper adjustments and review operating components for proper operation.

For more details, call A.H.E Home Elevators 800-530-4040



The ACCREDITED Difference is in the details

As the square footage of the average home increases, residential elevator installations have quickly becomes more than a luxury amenity. Freedom of mobility not only concerns those with disabilities, but any homeowner who dwells in a multi-level home. **ACCREDITED HOME ELEVATOR** has been custom designing, installing and servicing residential elevators for over 25 years. A family-owned and operated company, Accredited Elevator has quickly grown to become one the most qualified and sough after elevator companies.

The difference is in the details.

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