

Residential Elevators – Going up in Popularity

By Carol Lamkins, CMKBD, CID

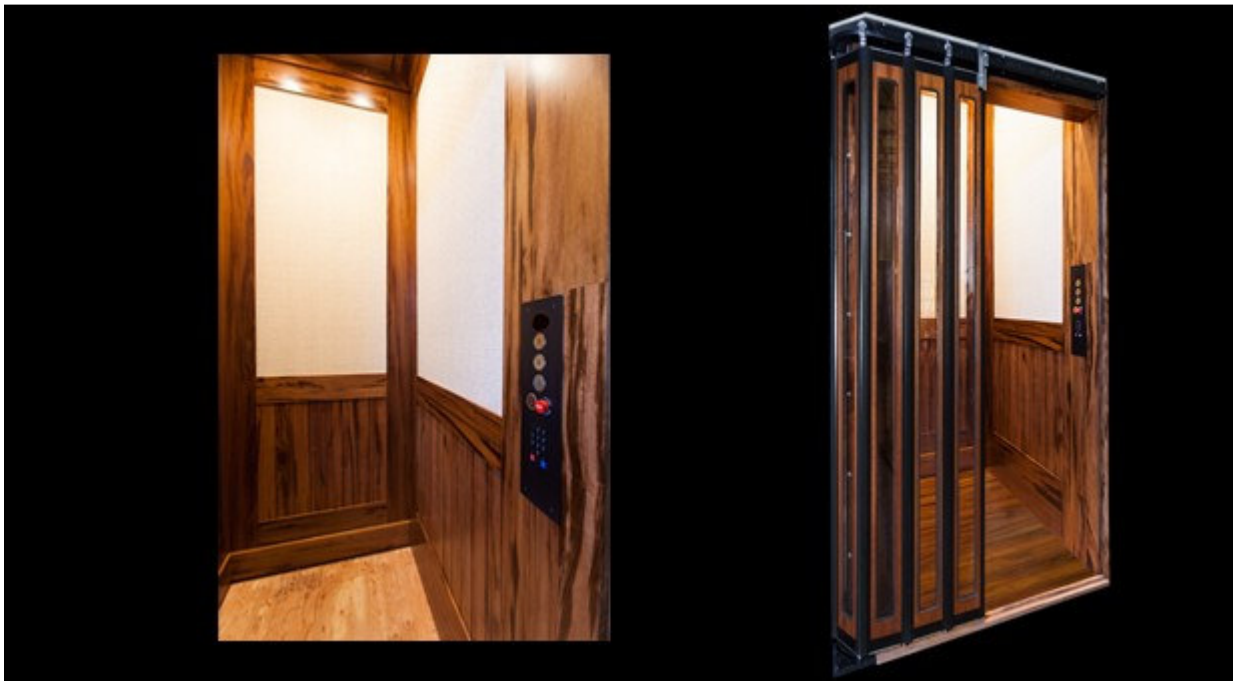
Residential elevators are gaining popularity as the Baby Boomers and their parents live longer lives. Multiple story homes have become an issue for aging in place. Today's hot ticket in real estate is accessible single level living environments. Adding an elevator can equalize the multi-level seller's market.

Elevators offer several advantages to the home. Residential elevators provide easy access, convenience and proven luxury appeal. The convenience is not only for fully agile or physically challenged people who live and their guests but residential elevators are a conveyance for luggage, groceries, pets, laundry and so on. They are also a sure way to add equity and value to the home maximizing resell value and increasing the buyer market.

A needs survey would question how many people and what type of equipment would be accommodated by the elevator. A gauge would be 1 to 5 persons and 551 to 881 pounds of weight. Ultra heavy duty residential elevators are even available to handle up to 1102 pounds.

The residential elevator has a maximum width 43.3" and a maximum depth 55.1". Fixed door widths are 29.5" to 37.4". It makes sense to have a minimum of 32" of clear opening for the doors to accommodate wheelchair access.

Elevator cabins can be upgraded to include glass inlay walls, partial and full glass walls and handrails. There is a huge selection range of interior finishes including wall, floor and ceiling. Interior and shaft lighting are also important considerations.



Courtesy of Acme Home Elevator, Inc.

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The quality of the materials, manufacturing, and installation is paramount in the selection process. Optional features to look for and ask about in selection a residential elevator are:

- Smooth start and finish based upon the multiple speed valve system
- State-of-the-art automatic controller and computer versus pressure control
- Non contaminating and environmental friendly oil products such as soy based hydraulic fluid
- Visual pollution of overhead motor room
- Energy efficiency such as Variable Frequency AC technology in conjunction with counterbalancing
- Power consumption
- Battery Back-up for elevator operation
- Noise impact of the drive mechanism
- Standard cabin height of 7'-4" but some are 8'-0"
- Durable materials in cabin interior with ¾" sturdy cabin walls
- Reliable call button
- Keyed hall station with "Car Here" and "In Use" indicators
- Rider safety - elevators installed in homes fall under a set of safety regulations that govern how home elevators are manufactured and installed (that code is the American Society of Mechanical Engineers or ASME Safety Code for Elevators and Escalators, Private Residence Elevators A 17.1)
 - A maximum speed 40 feet per minute
 - Arresting safeties
 - A working phone line in the cabin
 - A maximum cabin size of 15 square feet safe gate
 - Full height accordion gates included in cabin
 - Swing or slide doors with protected space gaps
 - Fire resistant wiring
 - Electrical locks that make it impossible for the elevator to travel away from the landing when the landing door is not properly closed
 - Mechanical locks that make it impossible for the elevator landing door to open when the elevator is not there
 - Light beam protection in door and landing doors that are set flush to shaft interiors
 - Airbags



Courtesy of Residential Elevators

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- Warranty packages are usually 3 to 10 years (subject to regular maintenance)
- Remote diagnostics and monitoring



Courtesy of Acme Home Elevator, Inc

It is recommended that all elevators automatically descend to the bottom floor and automatically unlock the door in the event of power failure. All elevators should have a separate battery supply that keeps the light on during power failure.

Another safety feature is the addition of limited mobility illuminating buttons including Braille.

Elevators require a hoistway in which to run. It is either built by a general contractor or supplied by the elevator company. Considerations include hoistway size, pit depth space, overhead space, machine cabinet location and power supply requirement. Fortunately the experts at the manufacturer are available for technical consultation as the plans are developed. California Building Codes require that installation be completed state licensed C11 Elevator Contractor.

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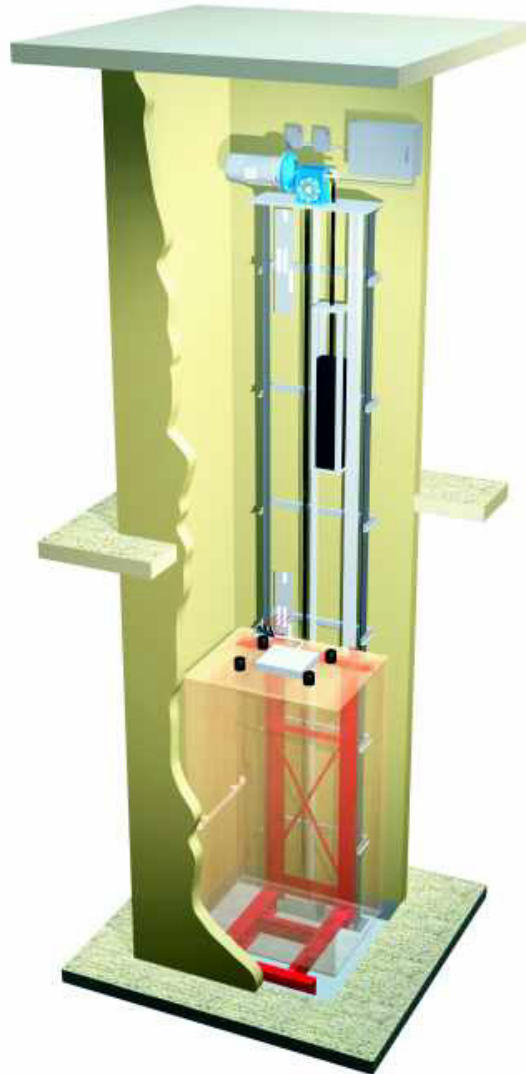
Hydraulic home elevators have a lifting capacity of over 950 pounds. They have been used for decades in the commercial and industrial elevator market. There are direct and roped hydraulic elevators. The direct model is slightly less expensive, but is limited in the amount of travel distance before a hole in the ground for the hydraulic cylinder is required. The roped model eliminates the need for a hole by using a pulley and hoist ropes, along with a broken rope safety back-up. The vast majority of residential hydraulic elevators are roped, as the slight increase in cost typically is far less than the expense of providing the hole. Both require the same size hoistway and machine room and have similar ride characteristics.

Hydraulic elevator courtesy of Residential Elevators

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Traction home elevators use the same technology as a 10 to 50 story commercial building and have been used for over 100 years. The operation is quiet, smooth and reliable. They are known for their lighter gauge frame components, lower capacity and smaller size. There are restrictions on some options, but usually no machine room is required. They are counterweighted for low energy use.



Traction elevator courtesy of Residential Elevators

Safety is a paramount concern in case of earthquakes in California. Measures include:

1. Take the elevator to the top floor.
2. Pull the emergency stop button completely out or make sure it is in the STOP position (this will prevent the elevator from lowering in the event of loss of power or recovery of power).
3. If the disconnects are accessible, turn them off.

Home elevators can be affected by cold weather in the mountains and snow areas of California. As interior designers, we need to be aware of the problems and space plan for appropriate machine rooms if required.

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Cold hydraulic oil is probably the biggest issue attributed to cold weather as the affects of large fluctuations in temperature of the hydraulic oil that lifts the hydraulic home elevator. Optimal temperature for the hydraulic system is between 85° to 95°F. If the machine room containing the hydraulic equipment is located in a “climate controlled” room this probably is not an issue. However, if the equipment is in the garage, attic, or in any other area that is NOT “climate controlled”, the result may be experiencing sporadic leveling of the elevator if not a “shut down” in the system.

There are two options to try to eliminate this problem. The first option is to control the temperature in the machine room/area to keep the hydraulic oil from experiencing large temperature fluctuations. The other option is to install a “Tank Heater” in the hydraulic oil reservoir to control the temperature of the oil. A Tank Heater can be installed relatively quickly by a trained elevator technician and usually proves to be a much less costly avenue versus controlling the temperature of the room itself.

Dry rails result if the elevator is making a funny noise from the elevator shaft. The noise may indicate that the main elevator steel guide rails need lubrication. The lubricant on these rails can some times dry out in cold weather causing the amount of friction between the guide rails and the moving elevator to increase thus causing a noise. Remember, an elevator shaft is a dangerous place to be and should only be entered by a trained elevator professional familiar with the safety features and the mechanical operation of an elevator.

The temperature inside the elevator may not be climate controlled” such as in a garage or the ground level of a home on stilts. The solution is to park the elevator on one of the floors that is climate controlled and even leave the swinging door open on one of these floors if the elevator is not in use. The result shall be a more comfortable interior temperature for those using the elevator. In fact some elevators have a parking or homing feature that can automatically be programmed to park the cab at a climate controlled floor. This is a relatively inexpensive way to do this and insures the elevator waits always at a consistent floor.

Battery back up system provide emergency lowering the event of power failure. Blizzards, freezing rain, ice storms, and even high energy demands on a grid can all cause a loss of power. The back up system must be kept in good shape, fully charged and ready to go in that unlikely event that there is a loss of power, especially when the elevator is in use. Maintenance and operational checks should be scheduled once a year and perhaps more often depending on the use and need.

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The first step in adding an area for an elevator is space planning the location for the hoistway and door connections. Practical locations are in the interior or added to the outside of the exterior wall of the living environment. These areas can be temporarily used as storage closets or incorporated into the adjacent space until the need arrives to add the elevator. This foresight is a value-added service of hiring a professional interior designer with the ability to project into future needs.



Courtesy of Freedom Lift



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Resources:

<http://www.acmehe.com>

<http://www.suncoastelevator.calls.net/hmelev.html>

<http://www.residentialelevators.com>

<http://www.residentialelevators.com/types.htm>

<http://www.liftshop.com.au/files/elevatorworld.com/marketing/Elevator%20World%20Article.pdf>

[http://www.elevatorboutique.com/Home-](http://www.elevatorboutique.com/Home-Elevators/Elfo/NiceToKnow/SafetyAndSecurity.php)

[Elevators/Elfo/NiceToKnow/SafetyAndSecurity.php](http://www.elevatorboutique.com/Home-Elevators/Elfo/NiceToKnow/SafetyAndSecurity.php)

<http://www.elevatorconcepts.com/residential-hydraulic-elevators.php>

“Space Between Swing Doors and Accordion Gates a Hazard on Private-Residence Elevators” by Lou Bialy, registered professional engineer with Otis Elevator, member of the ASME A17 Standards Committee and vice chairman of ASME A17 Mechanical Design and International Standards Committee