Home Elevators

BY GARY STRIEGLER

You'd think the one thing any builder wants to hear from a client is "Money is no object." But as a custom-home builder, I'd much rather hear "This is going to be the last house we live in." That mission statement puts the emphasis on quality and accessibility. It challenges me to build a house that will meet my clients' needs as they age.

The biggest challenge we face as we grow older is getting around, and stairs become our worst obstacle. A single-story house with no stairs can work for some people. But most of my clients prefer the style and curb appeal of a multistory house. A residential elevator can offer the best of both worlds.

Less saves more

The first elevator that I put into a house let me build a large master suite on the second floor. If I'd located the suite downstairs, I would have created unneeded space upstairs. The elevator actually paid for itself by allowing me to downsize the house. As a bonus, the master suite was blessed with a wonderful view and more privacy.

Building a house up instead of out has several economic benefits (sidebar, facing page). Consider this fact: For every square foot of a two-story house, the foundation and roofing costs are cut in half compared to the same square footage in a single story.

An elevator also can take some of the headache out of building a house on a sloping lot. In a house I recently built on such a lot, an elevator made it possible to put the garage under the house in what would have been an unfinished walk-out basement. Removing concerns about accessibility let me put a home theater and guest bedrooms in the basement. If these rooms were on the main floor, the house would have been at least 600 sq. ft. larger. And if I'd had to put the garage on the main level, foundation costs would have put the house beyond the homeowners' reach.

Elevators require no special framing

On average, elevators take up little space. Even the largest home

No longer an extravagance, a residential elevator actually can reduce the price of your new home, and it'll do the heavy lifting if you can't

Two ways to the top. *Stairs work fine while our legs are young and our burdens are light, but an elevator is a great alternative that can keep us in our two-story houses long after those knees have given out.*

elevators allowed (often 12 sq. ft., but 15 sq. ft. in some locales) typically need no more space than a good-size closet on each floor. The only trick is lining up the spaces on each floor to provide a path for the elevator.

The carpentry crew can frame and finish the elevator shaft, or hoistway. Then the elevator installer is called in to handle the rest of the job. Framing is the same as for other interior walls, except for the wall where the guide rail is located. The crew puts solid framing in this wall and bolts a 2x12 flat to the hoistway wall to hold the rail. The inside walls of the hoistway are finished in fire-code drywall (photo left, p. 86).

The bottom line for the top of the line

Residential-elevator prices range from $12,000 to more than $50,000. When you consider that a new automobile that is replaced every few years can cost at least that much, an elevator could turn out to be one of the best bargains in your new house. Unlike your car, an elevator won't depreciate in value over the years.

The location of your home can affect the cost as much as the type of elevator you put in. Each state decides what version of the national code it uses and how that code is enforced. Compliance with local building codes can drive up costs in some areas. And as with your automobile, the appointments and options that you choose can jack up

CONSIDER A HOME ELEVATOR

Residential elevators are surprisingly affordable, with basic models costing less than $15,000. A home elevator lets you build a house *up* instead of *out*, which has several advantages:

- Smaller house footprint.
- Lower foundation and roof costs.
- Better, more economical way to deal with sloped or tricky lots.
- Any house can become a solution for people who want to stay in their home as they age.

Other reasons to consider a home elevator:

- A residential elevator needs just the space of a closet on each floor.
- An elevator takes up much less space than additional stairs.
- After the initial cost for an elevator that makes a couple of stops, additional stops can cost less than extra stairs.
- With all the styles and materials available, an elevator can fit with the design of any home.

PLANNING AHEAD

If I'm building a house for someone who isn't ready to install an elevator right away, I sometimes design the house with closets stacked above one another to allow for an elevator in the future. The floors and ceilings of the closets are built to be easily removable when the time comes for installation.

The walls of the hoistway, or shaft, are framed conventionally, except for one wall that's beefed up to hold the elevator's guide rail. Once the walls are finished with fire-code drywall, the mechanicals are installed. The elevator car then is assembled in place.

the price you pay for your elevator pretty quickly.

Residential-elevator capacity can range from 500 lb. to 1000 lb. depending on the size of the car and the type of drive mechanism. That's either three good-size adults or one adult with a whole lot of groceries. The maximum rise for a home elevator is about 50 ft., or about five stories. Most of the elevators I've had installed have three stops, or three stories. But with an elevator, the cost of an additional stop beyond the requisite two is minimal (usually around $2,000). A custom staircase to an additional level can be just as expensive as each of the previous levels.

Cables vs. hydraulics

Home elevators fall into two basic types: hydraulic or cable. Hydraulic elevators are driven by a pump; cable elevators use an electric motor and steel cable to do the lifting. All the elevators I've had installed are the cable type. My elevator specialist, Mike Rector of Arkansas Home Elevators, argues that cable elevators are simpler with less to go wrong. He also says that in his experience with hydraulic elevators, the fluid inevitably spills or leaks, leaving a less-than-pleasant odor. Although they cost a bit more than their cable cousins, hydraulic elevators are speedier and run more smoothly.

Most cable elevators require a small, dedicated mechanical room adjacent to the elevator hoistway (photos facing page), although some manufacturers now offer elevators that have the cable motor mounted directly on the rail to save space. The mechanical room is usually in the basement or attic.

One advantage of a hydraulic system is that the pump can be almost anywhere in the house. Regardless of the type of elevator you choose, if you are preparing for a future installation, remember to run a 30-amp, 230v circuit to the mechanical area.

The bottom floor of the hoistway should be concrete, and it has to be recessed below the finished-floor level to accommodate the bottom of the elevator car. The depth of the pit varies from elevator to elevator, but it's usually a minimum of 5 in. Again, that is something to keep in mind if you are leaving a space in your home for a future elevator.

Elevator nitty-gritty

The elevator car or cab follows a guide rail as it travels up and down. Some manufacturers use one guide rail, and others use two. For the elevators in the houses I've built, a single guide

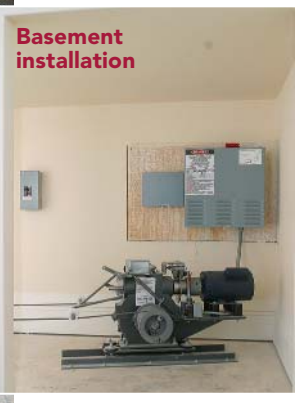
SWITCHES FOR SAFETY

Like their commercial cousins, home elevators are equipped with braking systems that stop the car should any part fail. Switches, such as those that lock the hoistway doors unless the car is at a stop, ensure the safety of all elevator passengers.

Attic installation

MECHANICAL OPTIONS

Most elevators require a mechanical room that contains the motor or pump, along with the electronics. The mechanical room is usually next to the elevator in the basement or attic.



Basement installation

rail mounts to the wall of the hoistway. With a single guiderail system, it's possible to have doors on three sides of the elevator car, which gives you a lot of flexibility in floor-plan design, especially if the elevator serves three or more floors. Most manufacturers offer the option of doors on at least two sides of the car.

A home elevator is a new concept to most folks. Many are leery about a home version of something normally found in a big commercial building. In a lot of ways, the two are similar. All elevators have the same type of safety brake to stop the car if there is a mechanical failure. Cable elevators have a hand crank to lower the elevator in the event of a power outage. Hydraulic units have a manual-release valve to lower the car. All the elevators in the houses I build are required to have an emergency phone and lighting just like commercial ones.

To enter a home elevator, you open the door to the hoistway, then open the door to the car. Each hoistway door looks like any other door in the house when it's closed. And each of these doors is equipped with a device called an interlock, which keeps the car from moving unless the hoistway door is closed (photo bottom right, facing page).

Doors to the car are usually scissors or the folding-panel type. Many companies offer car doors that close automatically. The car also is equipped with a switch that keeps it from moving until its door is closed.

The call switches in home elevators are similar to those in commercial elevators. Press a button, and the elevator arrives a short time later. These switches can vary greatly in style and price, and some let you know that the elevator is there waiting. Unlike commercial elevators, residential elevators are pretty pokey, crawling along at about 40 ft. to 50 ft. per minute. And for that real commercial elevator ambience, "elevator music" is always an option, for a price.

A home elevator always should be installed by a professional elevator technician. There are many reliable elevator manufacturers to choose from (see "Sources," right), and my recommendation is to pick one with a good reputation who is close enough to repair the elevator if needed and to do annual maintenance.

Elevators are not meant to replace stairways (commercial buildings still have enclosed stairwells). Instead, I like to think of elevators as complementary transportation between floors. Most of the high-end custom staircases that I build cost at least $6,000 per floor for materials and labor. A secondary enclosed stairway with a wall-mounted rail might be a quarter of that cost. Either way, an elevator translates to significant savings if it becomes your primary mode of transportation from one floor to the next. □

Gary Striegler lives and works in Fayetteville, Ark. Photos by Roe A. Osborn. **continued**

Sources

Access Industries
800-829-9760
www.dreamelevator.com

Cemcolift
800-962-3626
www.cemcolift.com

Concord
800-661-5112
www.concordelevator.com

Inclinator
800-343-9007
www.inclinator.com

National Wheel-O-Vator
800-551-9095
www.wheelovator.com

Residential Elevators
800-832-2004
www.residentialelevators.com

Waupaca Elevator
800-238-8739
www.waupacaelevator.com

Reader Response

Home elevators can be even bigger

In his article "Home Elevators" (*FHB* #169, pp. 84-87), Gary Striegler suggests that residential elevators are limited in size to 15 sq. ft. I recently had occasion to look into the elevator-car size limit in the American Society of Mechanical Engineers (ASME) A17.1, Section 5.3.1.10.1, Capacity of Private Residence Electric Elevators. According to the ASME staff, the 15-sq.-ft. car-size limit in this section of the standard is meant to define the scope of this part of the standard, not to set an absolute limit on elevator-car size in private residences. ASME does not prohibit the use of larger car sizes in private residences, but elevator installation and maintenance in such a case would be controlled by other applicable sections of ASME A17.1.

In North Carolina, the Department of Labor enforces elevator-safety standards statewide, and that agency chooses not to inspect elevators in private residences at all. However, because ASME A17.1 is recognized as the standard for elevators nationwide, installing an elevator of any kind in the United States without learning the standard and complying with it would leave a builder open to the kind of legal challenge that we all try very hard to avoid.

Many of us have learned the hard way the downside of accepting hearsay information about limitations established by codes and standards, especially when they run afoul of a demanding client's wish list. If you're going to tell your client it can't be done, it's wise to operate on completely reliable information. For more on ASME's elevator standards, go to www.asme.org.

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