15.
WINDOWS AND DOORS

In a home, the two most used architectural features are the ones that disappear from thought: windows and doors. Good architects see windows as design elements, interior designers see them as something that calls out for some treatment, and owners are focused on what the view looks like.

Over the decades, manufacturing technology has radically altered the size of windows used in residential applications. They've gotten much bigger and better insulated. Our downtown condo has huge windows. Looking out from my home office desk, the center window section is nearly 6 feet square. I'm also looking at a freight train going by but barely hearing it. Beyond the half-inch thermal break, the front and back panes are formed by two pieces of glass laminated together for significant sound deadening—four sheets of glass.

Windows and doors were an afterthought in my first couple of homes. You accepted what came with the house and were focused on features you loved and things you wanted to change. Our second suburban home started to change that perception.

In the old days, and I'm talking one-hundred-plus years here, glass panes were pretty small, not much larger than a standard sheet of paper. To create larger expanses of glass, these panes were set into frames. Though glass sheets would get bigger and bigger, the small pane still carried forward as something traditional and charming. Modern guy that I am, it always hit me, "Why would you want to break a view up into little pieces?" Shortly after we moved into our larger second suburban home, I noticed something amiss in the living room bay windows. True to more traditional styling, they were the small pane design, but with a difference. The glass was a larger single sheet, and tape had been applied inside the dual sheets to create the look of multiple panes. The problem was that the windows'

southern exposure was causing the tape to flake off. Oops. Almost nobody noticed this problem, but you couldn't unsee it once you saw it. We replaced the entire window units with new ones with no annoying taped segments blocking the view to the front of the street.

While that improvement made me happy, it didn't improve the view from the front lawn to parked cars and our mirror-image home across the street. The windows let in light (which we controlled with wood blinds) and not much else.

Residential windows are framed in several materials. The most inexpensive is aluminum. The next step up is vinyl, then fiberglass, and finally wood. High-end wood can be clad with either vinyl or aluminum for greater exterior protection. Wood windows offer more options in terms of interior design finish. They can be stained to bring out the wood grain or painted.

There can be a big difference in operable windows. You can quickly feel the quality in the smoothness of movement and satisfying closure with more expensive windows.

The glass itself can be tinted, frosted, tempered, and coated. A popular low-e coating is more energy efficient and can help reduce sun fading. Thermal windows are double and triple pane; some are filled with argon gas, adding more insulation. Over time, thermal paned windows will often lose their seal, creating condensation and requiring replacement.

When you consider building a home or replacing windows in an existing one, you're stepping into a complicated world of features and prices. Big box retailers carry a variety of styles and price ranges that fit into the band of "builder quality." Above that are the higher-end manufacturers offering their ascending ladders of pricing. Top manufacturers include Sierra Pacific (which we have in our condo), Marvin, Pella, and Andersen. All their top-of-the-line products are similar in construction and price. Our mountain house windows cost a little over $30,000 at the time, and that's about double what a "builder quality" window would cost. Were they worth it? Heavens yes. Just crank one open or pull the sliding door, and you'll feel the difference. And on super cold nights, you also feel the difference with very low cold conduction.

There are five primary styles of windows. There's the picture window, a fixed pane of glass; the double hung, which you vertically lift to open; the glider, which opens horizontally; the casement, which cranks out sideways; and the awning, which cranks out and up. A single window unit can combine several windows in one frame dimension. For the master suite bedrooms, I went with a uniform 5' x 5' foot square dimension throughout the house. Within that dimension, the picture window glass was 4 feet high, and below it were two operable awning windows that were 1 foot high.

Two of our great room window wall units were larger but similar, but the one difference is that only one of the lower windows was an awning, and the other was fixed. Why not have both the lower windows operable? It was an aesthetic call. All our operable windows have screens, and given the immense view from the great room, I wanted to minimize the reduced vision that a screen introduced. We'd get plenty of air from opening two windows (on the far right and left), so that would be two fewer screens. This is one of the tiny details that aren't seen but cumulatively add to a persistent feeling of quality.

Of course, when building a home in a scenic area, one expects to see views, but the two windows that consistently elicit comments are the ones in the garage. I placed two long linear windows about five feet above the floor. They let in light, and when visitors tour our home, they always say, "Look, it's a garage with a view." These weren't costly picture windows but represent the trifecta of good design: utility to let light in, enjoyment to see the view, and memorability that improves resale.

Like windows, be prepared for a dizzying array of door choices. The good news is that once you decide on a door style, it's just counting how many you need to order.

Interior Doors

The standard size for interior doors is 32" inches wide by 80" inches high (6' 8"). The furniture and appliance industry knows this width dimension is typical, so you'll usually see those kinds of products sized 30" or less. Contemporary doors are usually smooth-surfaced. More traditional designs come as 4 or 6 panels where the edge molding around the panels can be simple or more complexly

scrolled. Doors will be either hollow or solid core. Hollow core doors are lighter, less soundproof, and less expensive. Solid core doors typically use a dense particleboard and are covered with veneers ranging from exotic woods to Masonite. The third dimension is thickness. Standard doors are 1 3/8" inches. Thicker, premium doors are 1 3/4" inches. That buys you a little more sound-dampening and the physical sense of something more substantial (think of the thunk of a heavier car door).

When our son and daughter-in-law contracted for a new home, one of my suggestions was they ask the builder how much it would cost to upgrade the hollow core doors to solid ones. The cost was surprisingly modest. That small upgrade will give them a competitive advantage whenever they sell. Solid core doors feel more substantial and are more private.

Interior passage doors almost always come pre-hung with hinges attached to the frame. The door is also pre-drilled for the passage door knob/lever and strike plate. Pre-hung doors need to be specified as left or right swing. During framing, a carpenter will build the sides and header slightly larger than the pre-hung door unit. The door is slid into the frame and side nailed into the surrounding studs using shims. During the final finish, trim molding is cut and nailed around the door to hide the gap between the frame, header, and studs. The whole process makes door hanging much more straightforward than it was decades ago with a double plus of making it easier to level the door so that it swings open or closed, no matter what open position it's in.

If you're creating your floor plans or reviewing somebody else's, a door swing is a crucial thing to think about. The general rule of thumb is that most residential doors swing in. Notice that in commercial and public buildings, the exterior doors always swing out (in case of fire). A common swing-in problem can occur with small bedrooms where the door barely clears the bed and leaves no room for a nightstand. Whatever door width you choose, ensure enough swing clearance in the room. Regarding swing clearance (especially if you're creating the drawings), position the hinge side of the door 4"-6" inches from the wall. It needs to stick out a bit so that there's enough width for trim molding, which is 2- 3 inches in width.

Sometimes, you're confronted with the challenge of not having enough door swing. In that case, a pocket door can fit the bill. You must specify where pocket doors go in your plans to frame a hollow wall. Pocket doors are hung from a pre-installed metal track in the door header and swung up and into place. They don't come in a frame or with holes drilled for a passage set. While pocket doors solve door swing problems, they are not as straightforward or intuitive. They are best for areas you may occasionally want to close off, like a pantry or closet, but not for frequent use, like a bedroom or bath.

All the interior doors were solid-core 1 3/4" thick. The design featured a light grid pattern etched into the door face on both sides. Lever handles were used throughout.

I went with the extra thick solid core doors we hung throughout the house for those pocket doors. These are heavy doors—nearly one hundred pounds. Watching our painter wrestle with them, I voluntarily upped his check for "hazardous duty pay" on the description line. I used the same doors for the three pockets and three by-pass closets. The typical sliding door hardware for the closets wasn't designed for the weight, so I searched for a hardware company and found one in Idaho that had a solid enough track with heavy-duty wheels. That solved the closet problem, and fortunately,

the doors rolled easily. The pocket doors also roll easily — once you get them started, but it requires a reasonably strong tug at the small retractable pull recessed into the edge of the door. And while it works, it's not the ease of effort I strived for in all our fixtures. We've gotten used to them, but I'm still contemplating changing to lighter-weight ones.

A cousin of the pocket door is the barn door. This style has become more popular in the past few years. The barn door hangs from an external bar (like a curtain) and rolls back out of the way. Barn doors are cool looking and, with good rollers and bars, glide far more easily than pocket doors. However, they've got two negatives. First, they rob you of wall space where the door rolls to the side. Second, they don't seal off light and sound as well as regular or pocket doors. And while they can be attractive, their trendiness may be dated over time.

Exterior Doors

Exterior doors can be clad in steel, aluminum, fiberglass, wood, and Masonite. They serve multiple needs: security, insulation, and aesthetics. When considering nice-looking exterior doors to match the home design, get ready to add an extra zero to the check. Seeing great-looking front entry doors in the $5,000 to $15,000 range wasn't unusual.

Working through the same company I used for our windows, my rep pointed me to several manufacturers. Again, these aren't brands that show up in big-box retailers. It's like a new world hidden behind a curtain when you move into more specialized building products. But, it also requires a lot more research and sifting of options.

One big determiner was durability and our challenging mountain climate. That's why I finally landed on fiberglass doors. One of the excellent properties of fiberglass doors is they are less likely to warp or expand than wood. They are rot-proof and come in various surfaces, from smooth to wood-grained. My only knock against them is though they are solid and well-insulated, they have a lighter-weight feel. As described above, I like a heavy door's solidity and satisfying closing. I've been in homes with front entry doors that must weigh as much as a bank vault and open not from a side hinge but a mid-point pivot pulled open by a six-foot-long brushed stainless steel vertical

handle. Yeah, baby, now that's a door! And I could have had one — had I been willing to pay as much as all our five exterior doors combined cost. Then I got real. Usually, we are meeting our guests and we're the ones opening and closing our front door. So, who's going to care about how heavy it feels?

Like the front door, the three other exterior doors are fiberglass and have insulated frosted glass inserts to let light into the house. Our entry and mud room doors open into the house, but our two lower level doors, more unusually, open out. While I preferred having those two doors swing in, the one into the garage would have swung into a car. The one into the den would open into a landing and force you to step in the den and close the door, and only then could you walk into the guest room. Having the den door open to the outside allows the choice of going in either direction. After a year of observing family and guest behavior, I knew this was the right call, and nobody paid any attention to the door swings (nor should they!).

Garage Doors

You source garage doors from different manufacturers than other exterior and interior doors. The most common type is the articulated overhead door that travels up tracks and retracts to the ceiling. The most common types of materials are steel and composite wood. Usually, the dealer you buy the door from also installs them.

While garage doors can be sized for different widths and heights, they fall into single and double categories. Using two single doors instead of a double one is more of an aesthetic choice, though your opening to the outside is smaller in bad weather. Specifying single doors adds incremental costs for more framing, the base cost of doors, and motorized openers. It's not quite double, but it's close.

A standard two-car garage door is 16' x 7'. If you have one or two larger vehicles like a 4x4 pickup or van, you'll be happier if you can design for a door that's a foot wider and taller. This means adding width to the garage but, more importantly, height for the door tracks hanging from the ceiling.

Ordering a garage door with windows can be an excellent option, especially if no other windows are in the garage. One of the most gorgeous applications I've seen is a door with all panels filled with

frosted glass. This would be a pleasant space with a softly lit wall for a workshop or garage gym. On the other hand, garage windows may be a security weakness or prone to damage with kids playing in the driveway. It's a much more pleasant experience walking into a garage during the day lit by ambient lighting.

The door I chose was steel insulated and factory coated in black, so it will not require re-painting. A couple of inches of foam sandwiched between the panels makes a big difference. Our Vail house garage was integral to the home but not heated. On cold winter days, with the insulated door shut, the heat from the recently used car engines added enough warmth that even in sub-zero temperatures, you didn't see your breath when you walked into the garage in the morning. We keep the mountain house garage heated to 55F throughout the year, and the insulated door makes a big difference.

Almost all overhead doors use openers suspended from the ceiling. The three most common mechanisms are chain, screw, and belt drives. I've owned all three, and my strong preference is belt drive. Belt drives are much quieter in opening and closing and have proved reliable. All mid to higher-priced openers can be paired with Homelink, an automotive industry standard. Homelink is usually bundled with an upscale option on new cars and has three buttons in the visor for control of different doors and gates. When you get your new car, you go through a short process of holding your garage door remote near the visor and letting it learn the connection code.

Higher-end openers have a built-in or separate box to tie into home automation. However, for about $30, you can buy a third-party box that installs easily. That's what I did, and it took less than 30 minutes. Once installed and added to my smart home app, I can open and close the door from my phone, but the real winner is having my home app notify me whether the door is open or closed. No more driving down the block, wondering, "Did I leave the door open?"

Locks

Privacy locks are used for passage sets and must be specified when ordered. They are commonly used for bedrooms and bathrooms and can be unlocked with a tiny screwdriver or slim tab.

Exterior locks are usually a combination of doorknob and deadbolt locks. A mortise lock combines these features into one lock and is often used with high-end doors. Deadbolts and doorknobs are usually keyed alike.

Today, more and more locks are controlled by keypads, fobs, and smartphones. I used several products for our mountain house and have smart control on all our locks except the front door. Our front door is primarily used for welcoming company as our daily use is primarily through the garage or mudroom. Covering aesthetics and security, I chose a single deadbolt with a push latch for the front entry. I used a passage lever (no key) and a deadbolt above for the other three exterior doors.

The garage door has its keypad mounted on the side of the door jamb. The side door to the garage was where I added a fancy and expensive touchpad that could lock and unlock the door. A small wifi cube plugged into an outlet, shipped with the keypad and deadbolt. It allows me to control via the Yale lock app on my smart home app.

I bought a popular lock for the other two doors many short-term rental owners used. It's a smart controller that you replace the inside twist handle of the deadbolt with. The one I bought (August) is part of the Yale system and looks like an overgrown knob. It was easy to install and add to my home network.

These kinds of smart locks allow you to provide unique codes to visitors, families, renters, and cleaning crews. You can unlock a door when a repair person shows up while you're out and quickly see if that door is unlocked. The real genius of it all happens at the end of the evening when, from my iPad, I tap on a screen button I set up in the Apple Home app called "Good Night." That single tap turns out all the lights, lowers the heat in the bedroom until morning, and locks all the doors.

The Window and Door Tour

Every custom home design has its own unique needs. Here's how I approached selecting doors and windows and the thinking behind my decisions. Windows and doors are at the top of the product and design decisions hierarchy. For good architects, they are something to be carefully considered. A local builder unimaginatively following

generic designs will think more about plugging holes in the overall home like a checklist item. As you will soon see, I thought about doors and windows—a lot. They were a significant line item of the budget. Carpet, wall colors, and furniture may change over the years; however, windows and doors don't. You want to get this right.

Our family has a remarkably aligned sense, appreciation, and desire for modern design. From the get-go, none of us wanted a typical cabin-like mountain house. However, we've seen too many owner-driven designs that look completely out of character for an area. With our window and door choices, visitors and neighbors would see ours as a modern home with exterior lines and finishes that fit appropriately into the neighborhood.

Your choices and design scheme will be different from ours. However, this tour of the decisions and products for windows and doors will get you thinking more deeply about this critical but often under-appreciated component.

I needed four exterior doors. Given the dynamic mountain weather, I was looking for a well-insulated product with double pane frosted glass inserts to offer privacy and would not be prone to warping. I chose ThermaTru doors as they offered good quality at an upper-middle price.

An entry door is a gateway into a home's experience. Double-entry doors make a visual statement (welcome to the castle!), but have you ever entered a double-door house with both sides flung open? How often have you walked to a commercial building or through a store's double door and seen the sign "open other door?" Double doors are for aesthetics, not practicality. This is why I chose an oversized single door for the entry. While standard height is 6' 8" feet, I went with an 8' feet tall and 3' feet wide doorway, which provides a more formal sense of arrival and entry.

I specified a solid core door with a heavier 1 3/4" thickness inside. As they open and close, they feel substantial. And speaking of opening and closing, a higher-end hardware set for both the front entry and passage lock sets was chosen. My wife and I went to several high-end building material showrooms and flipped dozens of door handles, evaluating them for hand feel, look, and price. The

handles we chose are all lever action, and we tested quite a few regarding how the levers felt in your hands. The Emtek passage lever handles we settled on are also designed for a shorter twist downward to open. It's a small touch that most people won't feel, but the effect of handle ease and the solid heft of a heavier door creates a feeling of quality.

Door handles are but a small example of the hundreds of design and material decisions we picked our way through. And it's worth noting that these decisions weren't driven by impressing friends and guests but by what pleased us. Over the decades, we've learned that it isn't always about buying the most expensive things to impress others. However, skewing toward higher-quality materials rewards you with lasting quality and comfort in daily living. Visitors may not notice, but you will.

I looked at countless screens of exterior and interior door designs on the web and walked through gentrified city neighborhoods with modern homes. One afternoon, as we stood on the sidewalk admiring a front door, the owner opened it and asked, "Can I help you?" We had a delightful conversation on their patio, discussing modern urban and mountain homes.

The incredible view was the animating drive behind building the mountain house. So obviously, windows would play a big part. Here, two decision components came into play: the engineering of the window components and the experience of living with them.

The real enemy of the windows is the extreme ultraviolet light (UV) you encounter at high altitudes. We lived for 20 years at 7,500 feet. Though fair complexioned, I never bothered with sunscreen. When we arrived with our motorhome at the mountain house site, I quickly learned that 2,000 fewer feet of a protective atmosphere made a big difference in getting sunburned. Sunscreen is a must. And that same relentless UV penetration silently works on weathering materials; the effects can be color fading, oxidization, warping, and chalking.

At 9,700 feet, the mountain house is in a very challenging weather environment. Heat's not too much of an issue as the summer highs are in the low 80s and only for a short part of the day. Cold and

energy efficiency is a huge consideration. Sub-zero temps are as cold as -20ºF during the middle of winter. Beyond a good thermal barrier between two panes of glass, thicker frames around the windows made of less cold conductive material (wood and fiberglass) are better than vinyl and metal.

Heavy lift. It took five guys to muscle one of the living room wall windows into place.

As I edit this section, I sit at my desk in the corner between two 5' windows in the downstairs guest room. It's January, and the temp has increased from 0ºF to 14ºF. There's a storm stuck on the ridge across the valley, and we're being buffeted by some pretty steady winds around 15-20 MPH—solidly a sub-zero windchill. The room is 72ºF as I look up from my monitor at the grasses waving and the stout bristlecones slightly shimmying. I'm not feeling any drafts or bitter cold coming from the windows, and that's exactly what was expected.

I went with Andersen Windows, and that decision was driven by the fact that they were represented by a very good high-end dealer that my contractor worked with. I chose their Architectural Series, which is the top of the line. These windows are clad in anodized aluminum, most durable against the harsh UV. They have thick wood

frames, good thermal glazing, and excellent operating mechanisms. The windows were the single most expensive component of the home, with doors at number two. Once I decided on the brand and quality, it was time to move on to the experience.

An inspirational place to write a book. The fixed picture window is on the windy side of the house. The casement window on the left also meets building code emergence egress requirements and summer ventilation. Note the lower sills, which make the view feel more expansive in the room.

Wanting a modern look, I opted for thinner framed windows with large expanses of glass. Sash windows are common throughout the neighborhood as they are usually a lower-cost option. I prefer casement and awning windows, which I placed in several locations, including two bedrooms, as the code requires them for emergency exits.

Our thinking about windows has been shaped by our experience owning multiple homes. We lived in two suburban tract homes (lower-cost sliding and sash windows) and then spent twenty years in a custom mountain house (casement) and concurrently in an urban downtown condo (awning). Our Vail Valley house and Denver condo taught us much about a "window experience."

Our Vail house living room was all glass, 32 feet across and 16 feet high. When I designed a 1,200' addition for that house, the primary bedroom windows scaled to 23 feet across and 11 feet high. Our Denver condo floor plan is horizontal, with windows across the unit's full width and floor-to-ceiling glass up to 10 feet high.

And here's the BIG takeaway from these experiences: high windows that allegedly are supposed to bring the feeling of being outdoors are way overrated. They are hard to clean and, especially if they are of a custom geometric design, really hard to cover for light control. Surprisingly, windows that rise from the floor create a sense of flow from interior to exterior. And while our Fairplay weather is super fun to watch, when you think about it, you're always looking straight out at the view, not up at the sky. Windows that extend lower than the traditional waist-high sills enhance a sense of openness as a human's natural field of vision starts with the ground and then moves up to look ahead.

Automotive designers use low belt-line to describe lower dashboards with a big windshield curving up to the roofline. If, like me, you like driving cars that allow you to see easily over the hood, you're a good candidate for lower windows.

Playing for hours with the Live 3D Home software I designed the house with, I tested many different window geometries. I liked the even proportionality of square windows (most homes use rectangular windows horizontally and vertically), and the picture windows in our mountain house bedrooms are 5' square. From the outside, the large square windows are a noticeable differentiator from the other homes along the road. From the inside, these bigger windows are placed about 18" up from the floor. One could argue the lower glass limits furniture placement choices, such as a dresser. Still, nobody will be standing (or reclining) in any of the bedrooms without happily commenting on the view.

And getting back to that driving desire built around views—how we, and our visitors, perceive the view was the focus of hours of consideration. Before breaking ground, I would stand in various locations of the future site and use my hands, like a cinematographer,

to frame different views. This comes from an interest in photography when I was twelve and starting my career as a photographer.

Thinking of those framed views, I realized early on that we would need to push the house down the hill, so it opened a direct view of our closest 14er, Mt. Sherman. Five-foot square windows perfectly frame Mt. Sherman from the second-bedroom suite, the third bedroom/office, and the guest bedroom downstairs.

It's a couple of steps down from the west wall sliding door because the balcony deck is lowered to not obstruct the view inside the house.

With the house built into the grade, l wanted to create a sense of floating above the landscape as you looked across the valley, something I described as "helicopter views." This is why the largest windows are on the western side of the house. Our contractor brilliantly suggested lowering the balcony deck so the railing drops below your longer view, even if you're seated.

Our closest and most dramatic mountains are the twin peaks over 13,000 feet. That's all by careful design. Even though I had stood (and sat) on the site contemplating the home's rotation, it wasn't until the framing for the window wall was completed that I rested easier,

knowing that I nailed the proper view angle. And that angle changes as you move from the entry to the living room or the dining area. Putting the kitchen sink on the island instead of the exterior wall, typical of many homes, keeps the view front and center during meal prep.

The morning coffee view from the island. Dropping the deck and railing pulls it out of the big view.

Furthermore, the counter dining at the island has a deeper overhang on the south end of the island so that in the morning, you can move a bar stool around the corner and look out through the living room window wall. This was something that, when looking at the plan, perplexed our kitchen cabinet and counter vendor. When he arrived at the house during framing to take measurements, he said, "I wasn't sure why you designed it that way, but now I get it."

Older mountain homes generally have smaller windows with less surface area to get cold. Yes, the sliding doors will radiate cold more than smaller windows, but this can be mitigated by good insulated glass, window coverings at night, and efficient heating in the bedrooms.

Nighttime ventilation was another point of intense evaluation. Our city condo is such that there's too much noise at night to sleep with the windows open. In the mountain house, having fresh air and a summer breeze in the bedroom is a treat. The large bedroom suites had sliding doors parallel to the bed. For each room, I ensured that the operable side of the sliding doors was on the foot side of the bed so any breeze would be more indirect than blowing across the head. But there was another low-percentage but still plausible worry. What about critters at night nudging the sliding door open? Specifically, I was thinking about bears. While the area has bears, none that I was aware of were nuisances, but they are curious and persistent creatures, and the last thing I wanted to have to happen was to confront one in the middle of the night.

This meant that a more bear-proof operable window would be a safer solution. Sticking with the five-foot square design, there were two choices: a casement style or an awning. A casement window has a center mullion with both sides of the windows opening out. The awning style keeps the large expanse of glass above, with the tilt-out lower section taking up about a quarter of the window area. While the awning style doesn't open as widely (for maximum air circulation), it has several other benefits. It can remain open during a rain storm, it will not flex in the higher winds the house will endure throughout the seasons, and it's critter-proof. If, during warmer days, we want more air in the room, opening the sliding doors would amply provide that.

The situation for the third and fourth bedrooms was different. For symmetry, I kept the same five-foot square window design. I chose non-operable picture windows on the north walls of both bedrooms (also the ones that will take the brunt of the weather). For the adjacent wall, the code required casement styles for emergency exits.

I chose a combination of high and frosted glass for the rest of the windows, including the four doors. The high exterior windows let light in but afford privacy, as do the frosted inset panels on the doors. Given that the house sits on a three-acre site, there are no issues of neighbors seeing in. It's more about not having the house interior too visible when we're away.

Naturally, the defining view of the house was the great room. From the very beginning, I had always envisioned floor-to-ceiling glass. However, many styles tend to look more commercial or too modern for the lodge-y neighborhood mountain look. There were also some engineering considerations regarding a long beam span across the opening. I had a lot of confidence in our contractor and his lead foreman, but I also knew that pushing them out of their comfort zone and looking at steel beams and more commercial glass products would be risky. The safer bet was to stick with a residential product. Indeed, an eight-foot high center door would immediately have an impact. On each side, there would be two six-foot-wide by eight-foot-tall window units with low awning windows to provide air circulation when things got too breezy to keep the center door open. Those side units were over 400 pounds each and required five stout guys to ratchet them up on a track from the first floor and slide them into place. I was thrilled and relieved that the window wall units slid into place and were free of damage.

While some other adjustments to the interior floor plan occurred during framing, the window plan matched the 3D renderings my architectural software created. But one inspired moment came after the exterior windows and walls were completed.

I placed an operable casement window in the toilet room for the north bedroom suite. This would also allow light to enter the back of the bathroom interior during the day. The south suite was different. Behind the shower wall was the stairwell leading down to the garage. Like the main bath in our downtown condo, I had always anticipated this would be an interior room with artificial light. My wife had observed this and asked if there was a way to bring natural light into the bath area. We'd had experience with skylights in our Vail house (they leak), so I wasn't too keen on that idea. When we did the big addition for the Vail house, I designed a window of glass bricks above the deep corner tub to give us privacy from the neighbors but let plenty of light in.

I considered changing the framing plan for the mountain house to run clerestory windows between our bathroom wall and the great room but had concerns about sound and privacy. Before interior framing, I stood where the bathroom would be and had a thought. Why not put a large frosted window in the shower wall parallel to the

south window over the garage stairwell? For the night, I put a strip of LED lights behind it to keep that same cool backlighting feel. Of the many architectural decisions made in the design of the house, this one was the happiest accident.

A similarly inspired moment came after the framing between the upstairs great room and downstairs den was done. The second stairwell to the den and guest bedroom would typically be a solid wall. I was always bugged by the idea that it would feel like a chute entering a mine. Seeing the freshly completed open stairway, my first thought was to create an open cable railing instead of a solid wall. Then, a glass wall, cut in a triangular shape to fill the opening, occurred to me as a better solution. It would allow light to filter down from upstairs and provide a modest sound barrier between floor activities in the upstairs great room and downstairs den. And though the entire lower level of the house is at grade and with nine-foot ceilings, there can still be a lingering sense that it is a basement (which it isn't). Opening up the den with more light and visual space using a glass wall is a signature of modern architecture, which is the polar opposite of the timber frame style logs common to mountain home design.

And while the window view from the lower level didn't need to be as expansive as upstairs, it still needed to be panoramic. In this case, I went with a single rectangular window unit that matched the 5-foot height of the square windows and doubled the width to 10 feet, providing a nice sense of proportionality when viewed from the outside.

Windowsills are almost an afterthought. They are an optional exterior design feature but an interior necessity. Going for a sleek, modern look outside the house, I didn't use sills. Exterior sills made of brick or stone never need maintenance, but the more typical wood ones will require period scraping and repainting.

Interior sills hide the window's unfinished lower frame and provide a pleasing edge effect. Typically, they are finished with the same drywall texture as the rest of the interior window frame or covered with wood, tile, or stone. Water can always blow in onto the sill anywhere you can open a window. In that case, drywall finish sills should be avoided. With all the effort I had put into researching and

specifying windows, it wasn't until they were installed and we were about to start drywalling that our foreman asked me about them.

So back I went to the internet for another research product. I found a company whose only product was Corian windowsills. Corian is a popular solid surface counter product in various solid and finely speckled colors. It's durable and, most importantly, waterproof. Very few visitors even notice, but as part of the effect of looking expensive and well-designed, the sills play an important part.

LOOKING OUT

We have now lived in the mountain house for all four seasons. We built it for the view and honored that commitment with our window choices. When we describe the house to friends, it's rarely about floor plan specifics; it's always about the incredible weather changes, the 200+ elk herd, the coyote loping through the property, the bald eagles flying by at eye level, and how the canvas repaints itself daily. Getting the window design right, no matter what your location and home design, is critical.