Introduction

What is Cordwood Building?

We had best start with a definition.

Cordwood masonry: That style of construction by which walls are built of short logs—often called *log-ends*—laid up transversely within a matrix of mortar mix or other binder, much as a rank of firewood is stacked.

But Why Build with Cordwood?

Since the 80s, I have been answering this fundamental question with my list of "5-E" advantages of cordwood masonry. The list did not find its way into the first edition of this book back in 2003, so I am going to dust it off and polish it for this new edition, because the five points still hold true.

1. **Economy:** Cordwood masonry walls are low in cost, particularly when the owner-builder has a local source of appropriate wood. If clay is readily available on site, "cobwood" construction is an option, saving on Portland and lime. Sand and sawdust can usually be found quite inexpensively, and sand might even be indigenous to the building site.
2. **Energy efficiency:** Built properly, and with a wall thickness appropriate to the local climate, cordwood homes are easy to heat in the winter and stay nice and cool during the summer. The secret is the wonderful juxtaposition of insulation and thermal mass, discussed in Chapter 3.
3. **Easy to build:** I like to say that children, grandmothers and beavers can all build with cordwood masonry…and do so time and again. Our oldest son, Rohan, built his first little cordwood playhouse at age seven and was teaching cordwood masonry to Chicago's inner city youth when he was nine. His brother Darin grew

up with cordwood, has taught it with us at Earthwood and lives in his owner-built home, which he calls Driftwood.

4. **Esthetically pleasing:** "A cordwood wall combines the warmth of wood with the pleasing relief and visual interest of stone masonry." I wrote those words in 1992. It's still true, but build quality is getting better all the time. Many builders have taken cordwood to an art form in the past ten years or so.
5. **Environmentally friendly:** Cordwood makes use of wood which might otherwise go to waste, even tipped into landfills. I have used ends and pieces from sawmills, log cabin manufacturers and furniture makers. Hollow log? Not much good for the sawmill, but an interesting feature as a special log-end with a "bottle-end" at its center. See also Chapter 5: Is Cordwood Green?

How?

"Why" is a very important question, but once the decision is made to "go cordwood," the equally important question becomes "How?" The answer to this one is the main thrust of this book.

Now, cordwood masonry may sound to some like an oxymoron, like painless dentistry. There is a popular but misguided legend in the building field that you can't put wood up against mortar and expect it to last very long. Full stop, end of story. To which I say, respectfully: "Bunk!"

Deterioration in wood is caused, first and foremost, by fungi, little beings who use the cellulose as food. To propagate, fungi require a constant damp condition. Cordwood masonry, with its log-ends laid up transversely in the wall—on end grain—have a remarkable ability to breathe. The wall may get wet in a driving rainstorm, but it dries very quickly thanks to excellent breathability through the longitudinal fibers and cell structure. The wall gets wet. The wall dries out. Wet, dry. Wet, dry. The fungi do not get a foothold to create offspring.

Cordwood masonry has been used on both sides of the Atlantic for around 200 years, maybe more. (See Prologue: History of Cordwood Masonry). And there are examples of existing buildings where the log-ends are still in good condition since the nineteenth century. In fact, in some cases, a kind of petrifaction seems to have taken place.

The building technique was passed down from generation to generation in North America and Scandinavia, but never took off, so to speak. This began to change dramatically in 1977 when three how-to books appeared within months of each other, each dealing with a different cordwood masonry methodology. They were: Jack Henstridge's *Building the Cordwood Home* (load-bearing round and curved-wall homes); the University of Manitoba's *Stackwall: How to Build It* (stackwall or built-up corner method); and my own *How to Build Log-End Houses* (cordwood as infilling within a strong timber frame). Magazines like *Mother Earth News*, *Farmstead*, *Harrowsmith*, and, later, *BackHome* took the ball and ran with it. Cordwood became a staple of the owner-builder movement, although it never experienced the sudden rapid rise in popularity of earth-sheltered (underground) housing or strawbale construction.

Cordwood's growth has remained steady since 1977, and has been spurred on by five Continental Cordwood Conferences (CoCoCo), the first at our Earthwood Building School (West Chazy, New York) in 1994, followed by: Cambridge, New York, in 1999; Merrill, Wisconsin, in 2005; the University of Manitoba in 2011; and Earthwood again in July of 2015, just months ago as I write these words. These conferences have brought together cordwood masonry's shakers and movers from all over the world, sharing their new discoveries, techniques and case studies. Now there are websites, blogs and chat rooms devoted to cordwood masonry; the main ones are listed in the Bibliography.

The most recent collection of CoCoCo papers has yielded brand-new information and stories of interesting projects around the world, and these papers have been redone for this book by the authors and myself, particularly Chapters 13, 14, 16, 17, 18, 19, 20, 21 and 22. Any chapter without a byline was written by me.

"Part One: Cordwood Basics" contains the fundamental information that a builder needs to be able to construct a sound, beautiful, long-lasting cordwood wall.

"Part Two: The New State of the Art" expands upon the basics, and shares new techniques, mortar and insulation options, electrical and structural considerations, and the like.

"Part Three: Case Studies from Around the World" showcases projects from North America, Australia, Sweden, Latin America and Hawaii.

"Part Four: Economics and Code" discusses the economics of cordwood building and how to satisfy code requirements.

Most of this book is completely new. But, in the name of fair disclosure, Part One has quite a bit of rewritten and expanded information from *Cordwood Building: The State of the Art* (New Society Publishers, 2003). The color section is entirely new, and illustrates the latest cordwood masonry developments in a strikingly visual manner.

— Rob Roy, Author/Editor

PART 1

Cordwood Basics

CHAPTER 1

Three Cordwood Masonry Styles

There are three different ways that cordwood masonry can be used in building: as infilling within a strong timber frame; with curved load-bearing walls; or with load-bearing stackwall corners with regular cordwood masonry between them. Jaki and I have used all three styles over 40 years and have the following observations to share.

Cordwood Infilling Within a Strong Timber Frame

A strong timber frame—sometimes called post and beam—allows a roof to be built before the cordwood walls, protecting the masonry work as well as the builder during wall construction. This strategy also protects the building through the winter in case the walls are not completed in a single season. This can happen, especially with inexperienced owner-builders. When we built Earthwood—round, with load-bearing cordwood walls—our work was exposed to the elements. We'd constantly have to build temporary covered work stations, or not work at all. We love Earthwood, but the one change we would make would be to build it under a roof umbrella supported by a 16-sided timber frame, virtually round.

Our first home, Log End Cottage, was framed with posts recycled from old barn timbers. Their dimensions varied from 8 inches by 8 inches up to 9 inches by 9 inches. The sidewall girts—the timbers that join the tops of the posts, sometimes called plate beams—were of similar dimensions. The post and girt system compartmentalized the exterior of Log End into 18 "panels" of cordwood masonry: seven on each side of the building, and two larger ones at each end. To provide rigidity to the frame, we installed permanent diagonal bracing into 12 of the panels, composed of two adjacent 3-inch by 10-inch recycled timbers, with a 3-inch insulated space between them. We were also trying to simulate the pleasing appearance of the old English "black and white" houses from the middle ages. Although we accomplished

1.1. Log End Cottage.

both goals, we would not use the permanent diagonal bracing again. It was a pain to build cordwood masonry up to the underside of the diagonals. And the structural rigidity we wanted—to resist against wind shear—is easily accomplished with temporary diagonal bracing screwed diagonally onto the frame and removed when it is time to build that particular panel. When the panel's cordwood masonry is complete, it accomplishes the same purpose as the diagonals: resistance against strong winds.

In 1975, we cut our cordwood into log-end length—about 9 inches—and stacked it up loose within the frame, without mortar, for a full year's drying. We actually moved into the unfinished building in December of 1975 and tacked a half-inch of insulation board on the exterior to see us through that first North Country winter. Was the house cold? *Very.* But we were young and freshly married and, with two woodstoves and two large dogs, we toughed it out. In 1976, we kicked one panel at a time out onto the grass, and rebuilt it in one day, before the mosquitoes came in. Sometimes we were pointing our mortar joints by car headlight and kerosene lamps.

Mistakes

We made mistakes and they are worth reporting, even though they are not related to the Cottage being a timber-framed building. My father was fond of saying that a smart man learns from his mistakes and a wise man learns from the mistakes of others. So these are for you:

1. **Thin mortar joints:** This made pointing difficult and actually reduced energy efficiency, as discussed in Chapter 3 and expanded upon in Chapter 14.
2. **Mortar shrinkage:** We solved this one on the very last panel. Again, see Chapter 3.
3. **Wall thickness:** The walls were too narrow for our cold North Country winters. To match our framework, we decided on log-ends 9 inches long. While the cottage had charming comforts of its own, energy efficiency was not one of them. In the three years that we lived there, we consumed an average of seven full cords of hardwood each winter. Too much.
4. **Basements:** We built on a basement, not a success in either practical or economic terms. Half of our total $6,000 expenditure went into the basement, which was used maybe five percent of the time. Since Log End Cottage, I have

not spoken very highly of basements, although I am very much in favor of high-quality earth-sheltered space—a totally different concept—which we achieved with our next two homes, Log End Cave and Earthwood. The difference, and the construction details, are detailed in my *Earth-Sheltered Houses* (New Society Publishers, 2006).

5. **House shape:** The Cottage was twice as long as it was wide, yielding a poor relationship between its perimeter and enclosed space. Much more on the impact of house shape on cost and efficiency will be found in Chapter 23.
6. **Poor orientation:** The Greeks knew thousands of years ago that the orientation of any home can make a 35 percent difference in energy efficiency. Log End Cottage ran north-south. An east-west orientation would have greatly increased solar gain in the winter, another deficiency that we cured at Log End Cave and Earthwood.

Only the first three mistakes above were cordwood related, and none of them directly related to the timber frame, but feel free to be wise with all of them. How to build thicker cordwood walls within a timber frame is discussed in Chapter 4.

After Log End Cottage, we built Log End Cave and Log End Sauna, all on the same 23-acre homestead, and all using cordwood as infilling within timber framing.

1.2. Log End Cave.

1.3. Log End Sauna.

Log End Cave also introduced us to earth-sheltered housing.

Before leaving this style of cordwood construction, I must say that beside the umbrella protection afforded, there is another potentially valuable benefit from doing cordwood within a timber frame: it could very well be a real plus if you have a tough building inspector. He or she will understand the structural value of the timber frame, but might be more difficult to convince with regard to cordwood's load-bearing ability.

Cordwood as Curved Load-bearing Walls

Why don't I just say round? Well, most buildings in this category *are* round, but not every one. Chapter 16 shows a curved wall example that is not. But we have done six truly round load-bearing cordwood buildings, and there have been hundreds of others around the world.

On the plus side, round is great for enclosing maximum space for the least amount of wall materials (and, therefore, labor). Plus, they have a great feel to them, a comfort hard to describe. Is it a back-to-the-womb thing? Or does our human DNA have our long history of living in round buildings built in? Even today, many so-called "primitive" people would not think of living in any other shape.

Downsides to round? Well, unless you have the luxury of building under a geodesic dome—something we were able to do with both our office building at Earthwood and our summer home, Mushwood—you will be at the mercy of the weather throughout wall construction. At Earthwood, we constantly moved a temporary cover around the building to work under. Also, we had to be very careful that the tops of the cordwood wall were covered each night with plastic and weights so that water would shed away and wind wouldn't blow our cover off the wall. At our 10-foot-diameter round sauna, we installed a 16-foot-square posted plastic tarp over the whole site, but still used a plastic cover directly on the cordwood wall in case of driving rain.

Arguably, another downside is that furniture might not always fit neatly up to the wall, particularly with smaller buildings. Rooms may be tricky to fit furniture into, particularly bedrooms, which frequently assume a trapezoidal shape. Here's another good reason for the 16-sided timber frame strategy already mentioned: on a house of Earthwood's size—38 feet 8 inches outside diameter—you get 16 8-foot-long perimeter walls for easier placement of countertops, sofas, bookcases, etc.

Some students coming through Earthwood express a fear that round will be too difficult for them, despite the fact that most birds, bees and beavers would not think of doing it any other way. I think it is because a round building is out of the ordinary, at least for most westerners. But the fact is that once you get over the mental block, round is surprisingly easy, in some ways easier than rectilinear: laying out the foundation and walls, for example.

It all starts with the center. Every point on both the foundation and the cordwood wall footprints—inner and outer surfaces—is equidistant from the center. I drive a stake firmly into the ground or, better, the center of my sand pad upon which I am going to "float" my footings. In the case of a small building, a monolithic floating slab (footings and floor poured at once) might be appropriate. I put a nail in this stake, the precise center, upon which I can clip one end of a measuring tape. Now, with a stick, I simply describe a circle in the sand corresponding to the radius of the component I am building: the inner and outer edges of my concrete footings, for example, or the outer radius of the monolithic round slab. When the foundation is in place—generally concrete in the case of a round building, although stone or earthbags can be used—I use an indelible marker to show the inner and outer radii of the cordwood wall itself. And we're ready to build. It's that simple! (Almost.)

1.4. Earthwood, circa 1990.

1.5. Mushwood, present day.

The only thing that remains is to keep the wall going up vertically and there are two ways to do this.

Plumb bubble method. After the first couple of courses of cordwood masonry, frequent use of the plumb bubble of a 4-foot or 6-foot level will assure that the wall is going up vertically. My personal rule is to check for plumb every five or six log-ends, particularly the larger log-ends. Place the level vertically so that one surface is up against the first course that you laid according to the indelible crayon marks on the foundation. Place a higher part of the level against the log-end you want to check. The newly laid log may have to be tapped slightly in or out so that its inner surface is absolutely plumb to its fellow below. Use the impact strike of a hammer to move a log slightly in its fresh mortar joint. A fist can shake the whole wall. Always use the level on the inside of the wall so that any log-end length error takes place on the exterior.

Center pipe method. (I have heard that this was used in medieval castle turret construction.) At the time of pouring concrete, place a short 1-inch-diameter pipe with a threaded end at the very center of the building. In the slab, drill three half-inch holes, 2 inches deep, into the slab, each at about 6 feet from the center and equally spaced every 120 degrees around the circle. Place leaded expansion shields into the holes. When you are ready to build your round cordwood wall, place a female union fitting onto the pipe. To this, insert a pipe as high as the wall you want to build, seven feet for example. Pre-drill quarter-inch holes all the way through the pipe, every 9 inches along its length, so that a 16-penny nail can be inserted through at frequent height intervals. In the three expansion shields, screw in O-ring screws of the correct diameter for the expansion shields. Now plumb the pipe perfectly vertical, with cables stretched from its top to the three O-rings sticking out of the slab. You can plumb and tighten the three cables with turnbuckles.

Place a bull's ring around the pipe so that it can easily slide up and down. Tie a nonstretch line to the bull's ring and put a plumb bob at the other end, so that, when extended horizontally, the total length of the line from the center of the building to the tip of the plumb bob is exactly the same as the inner radius of the circle. Now build in courses. Lay the inner surface of each log-end up to the plumb bob at the end of the extended line, assuring that each is equidistant from the center and that the course is round. To keep the line horizontal—and the wall plumb—move the bull's ring up as needed and support it by a 16-penny nail. Now your wall will be

1.6. The center pipe method.

1.7. Equipment needed for the center pipe method: leaded expansion shields to insert into slab (*upper left*); eye bolt to go into the expansion shield (*upper right*); turnbuckle for tensioning the guy wires (*lower left*); opening O-ring to slide up and down the center pole (*lower right*).

curved correctly…and plumb. Thanks to Pythagorean trigonometry, it is not imperative that the line be perfectly level; within five degrees is fine. But if you don't move the bull's ring up at all, your building, after a while, will start to look more like a dome than a cylinder.

This may seem like a lot of work, but it will assure quality control. We have seen it done, on a 32-foot diameter home in central New York, and the system worked very well. But we have had good results with the plumb bubble method. Choose the technique that appeals to you.

Finally, while a cylinder is inherently stronger against lateral (sideways) load than a box shape, there is almost no tensile strength between log-ends and mortar. I would not use load-bearing cordwood masonry in seismic zones, and no competent code enforcement officer would either.

Cordwood with Stackwall Corners

Stackwall corners are built-up of criss-crossed "quoins" of regular log-ends. (The word derives from the regularly-shaped stones found at corners and around windows and doors in stone masonry.) This style has been most prevalent in Canada because it enabled builders to construct very wide cordwood walls—24 inches or more—appropriate for cold climates. Many stackwall-cornered barns were built in Ontario, Quebec and Wisconsin in the 19th century.

Quoins can be made from timbers milled to square or rectangular cross-section, such as: 4 inch by 4 inch, 6 inch by 6 inch, 4 inch by 8 inch and the like. Quoins made from logs milled on three sides, or two opposite sides, work well and can be quite attractive. Sometimes, useful short pieces can be obtained at low or little cost from log cabin manufacturers. Another option is quartered logs, either sawn or hand-split. And several old-time and modern builders have used regular cylindrical log-ends as quoins, but it is my strong opinion that these have an inherent instability, particularly as there is no lasting chemical bond between wood and mortar. Finally, some builders have successfully used decorative cast concrete or concrete blocks as corner quoins. Back in the 80s, Jaki and I saw a cordwood building in North Carolina with stone quoins.

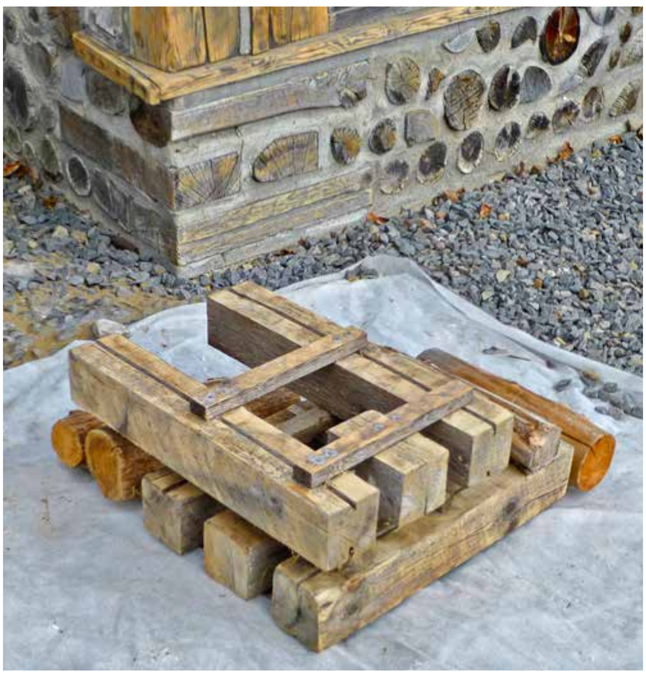
But the best of the wooden quoin options is undoubtedly a system developed by Gary Lomax in New Brunswick back in the 1980s, and now called the Lomax Corner.

No matter which corner quoin system you use, the order of events is the same: build your stackwall corners up about three feet, give or take. Use your plumb bubble on each side of the corner. Stretch a mason's line from one corner to the next, using clips made for the purpose. The clips hold the line a quarter-inch away from the wall. Build the cordwood walls between stackwall corners according to the

The Lomax Corner

Lomax Corner units facilitate the building of straight, strong, regular, well-insulated stackwall corners. The corners rise at a constant rate with these regular units, pre-made full-width quoins. They are composed of regular squared quoins and stabilizing cross-pieces made from full-sized 1-inch by 1-inch or 1-inch by 2-inch wood, as seen in Figure 1.8.

The advantages of the Lomax system are: (1) stronger than individual quoins, (2) faster and easier to level and plumb the corners, as fewer pieces are handled and (3) each corner goes up at exactly the same rate—6 inches in the example pictured in Figure 1.8—so that all four corners wind up at the same height. For example, sixteen Lomax units, each building the wall up 6 inches, totals 96 inches, or exactly 8 feet.



1.8. Two Lomax corner units, made from 4-inch-square timber stock , are stacked one upon the other. Note the tie pieces and chainsaw grooves for better friction bond to the mortar, not shown in this model. The short block is simply a decorative filler piece and helps retain the sawdust insulation which will be placed in the continuous inner cavity of the corner. In the background is a stackwall corner at Earthwood, made from 4-inch by 8-inch quoins for this 16- inch cordwood wall. The wall continues above with the cordwood supported by a "double-wide" pair of adjacent 8-inch-square posts.

line, keeping a quarter-inch space between log-end and line. If you touch it, you will begin to push the line out of straight.

There is one more important development in stackwall corners, developed back in the 1980s. It is best to make two lengths of quoins, be they Lomax units or not, half of the quoins being about 6 inches longer than the shorter ones. Now, when mortaring up the stackwall units, alternate short and long quoins on each side of the corner, so that you do not have a weak long vertical joint from the end of one quoin to the next. The longer quoins break up this weak joint, especially important in corners, which are subjected to greater settling loads than the rest of the wall. An example of alternating lengths of quoins can be seen in Figure 1.9.

There have been some beautiful and successful stackwall-cornered homes built in the United States and in Canada, but I am compelled to list what I have observed, over the years, to be upsides and downsides of this method.

Stackwall Corners: Upsides

1. Stackwall corners might be a good choice if you haven't got access to affordable heavy timbers for a timber frame. (But see Item 1 in Downsides below.) You can make quoins from quartered

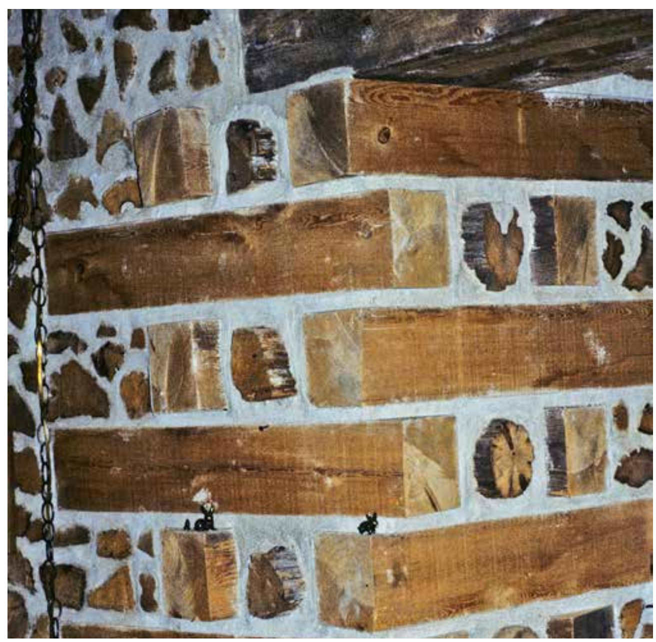
1.9. This small pump-house in North Carolina was made with single-wide quoins, cut from tulip poplar with a chainsaw, then water-sealed to minimize water absorption from mortar to wood. The staggered length of the quoins is clear in this image.

logs or by ripping two slabs off a log with a chainsaw, as in Figure 1.9. Do not be tempted to use weak quoins made from cylindrical logs.

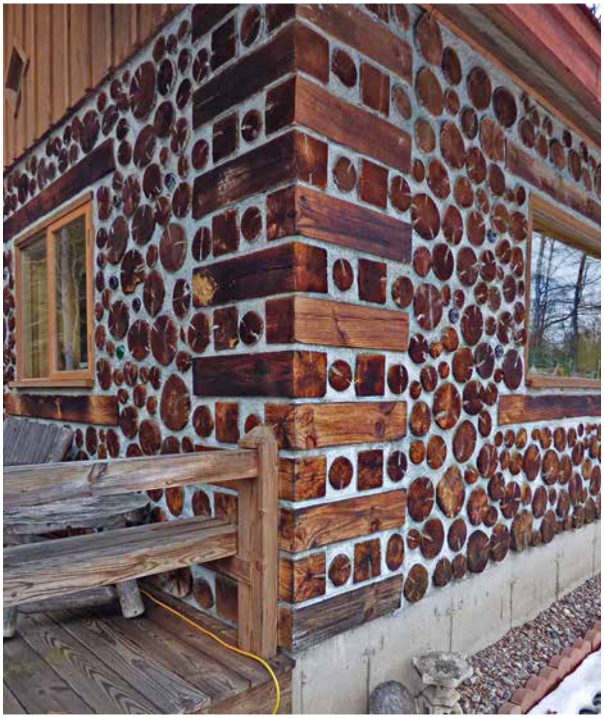
2. You can build any thickness of wall you like with stackwall corners. I have visited several cordwood homes with 24-inch-thick walls, most of them in Canada.
3. Done with care, stackwall corners can be very beautiful, as seen in Figure 1.11.

Stackwall Corners: Downsides

1. It takes more milled lumber to build stackwall corners than a single post. Also, in common with a timber frame, stackwall corners need to be tied to each other with a strong plate beam (girt) system, upon which floor joists, trusses or roof rafters are placed. Single 8-inch by 8-inch posts can be used as corners and vertical posts



1.10. An internal stackwall corner on a house in Thornton, Ontario.



1.11. A beautiful stackwall cornered addition in Peru, New York, built without staggered-length quoins.

every 8 or 10 feet along sidewalls to support the plate beam, even on walls 16 inches thick or greater. For details, see Building Thicker Cordwood Walls Within a Timber Frame in Chapter 4.

2. Building stackwall corners takes a lot longer than erecting a timber frame for the same size of building. Some of this extra time is spent on covering and uncovering the work every day, but the biggest time-killers are the rainy days that completely stop work. True, there is an additional skill set required to do the timber frame, but this is also the case with stackwall corners. See my *Timber Framing for the Rest of Us* (New Society Publishers, 2004) for tips on how to build a strong timber frame quickly and easily with inexpensive commonly available fasteners.
3. You can't get the roof on (or the building site covered) until all the cordwood is completed. Electric, windows and doors, and other building components are exposed to the elements. (This is also true of curved wall buildings not built under cover.)
4. There is a very real possibility of quoins swelling from mortar moisture or rain causing an outward tilt to the wall. We have seen this on a 16-inch-thick stackwall cornered home in Northern New York, even though the building employed strong Lomax units. The danger is that squared timbers readily absorb moisture through the sawn edges. This danger can be significantly diminished by the application of a water seal product on all parts of the sawn quoins that will be in contact with mortar. My favorite sealer for the purpose is Cabot's Silicone-based Waterproofing.

Door Frames

With all three methods of building with cordwood, there is one common denominator, and that is the need for very strong door frames, composed of two side members, called jambs, and a header tying them together on top. Cordwood is heavy and plastic during its first couple of days of curing, even longer with lime putty mortar and cob. The wall imparts a strong lateral load on a door frame, which can cause it to bow inward. Even a full-sized 2-inch-thick frame may not be strong enough, and a "2-by" bought from a box store or most lumber yards is actually only 1.5 inches thick and almost certain to bow and make it impossible to use the door. A full-sized

3-inch-thick member should be considered the minimum, which you can procure on order from local sawmills. Planed smooth, a 3-by-8 will actually be 2.5 inches by 7.5 inches. Having said that, I tend to use full 4-inch-wide framing. Earthwood, for example, has door jambs composed of two 4-inch by 8-inch timbers scabbed together with a vertical 1-inch by 6-inch key piece along its full height. The key does double duty; it ties the inner and outer door jambs together for construction and it provides a positive locking key for the cordwood masonry later on. Likewise, the door's header should be made of the same material.

With narrower cordwood walls, a single-wide set of jambs with header will do—4-by-8 inch material for an 8-inch wall, 4-by-10 stock for a 10-inch wall, etc. I always like to extend my header out about 4 inches proud of the door jambs on each side, as seen in Figure 1.12. It looks good, yes, but it also lends a little extra bending strength to the header, particularly on wide door frames, such as a 6-foot sliding glass door unit. In fact, on wide doors, I will extend the header as much as 8 inches both sides. Fasten the header to the posts with two strong structural screws, such as TimberLok or—my favorite—GRK structural screws.

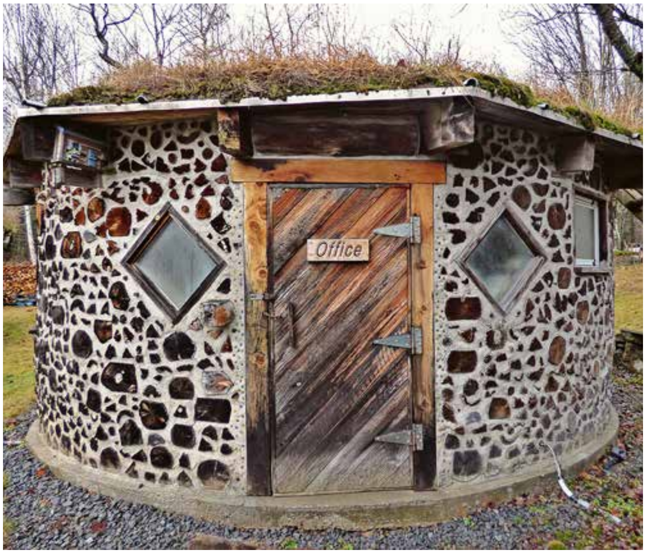
1.12. Top of door frame at Earthwood, made from doubled 4-inch by 8-inch jambs and header.

The various methods of fastening posts and heavy door jambs to a concrete foundation are beyond the scope of a book about cordwood, but are discussed in detail in Chapter 4 of my *Timber Framing for the Rest of Us.*

When building cordwood within a strong timber frame, it is very worthwhile to plan your timber frame to accommodate door frames and windows, as we did at Log End Cottage and Cave, as well as several of the outbuildings at Earthwood. At the Cottage, our 8-by-8 inch posts served double duty as door jambs. The heavy girt that joins the top of the sidewall posts can also serve as the door header (or the tops of window frames). A lot of time and money is thus saved at the design stage. Four examples from four different shapes of building, are shown in Figures 1.13 to 1.16.

1.13. Log End Cottage, built in 1975. Doors and windows are enclosed by the timber frame itself, mostly 8-inch by 8-inch recycled barn beams.

1.14. Strawbale (and cordwood) guest house at Earthwood. The door is exactly framed by the 4-inch by 8-inch jambs which extend from the foundation to the 8-inch by 8-inch girt.



1.15. Our round office building has walls 12 inches thick. The door frame is made from full-sized 6-inch by 12-inch timbers. Note that the header carries a few inches into the cordwood masonry. Yes, this door opens out.

1.16. Stoneview is an octagonal guesthouse with eight 8-inch by 8-inch girts joined over eight special posts. Both the door jambs and the long window frames (all 4-inch by 8-inch stock) extend from the floating slab to the underside of the girts. Full framing details are in my book *Stoneview: How to Build an Eco-friendly Little Guesthouse* (New Society Publishers, 2008.)

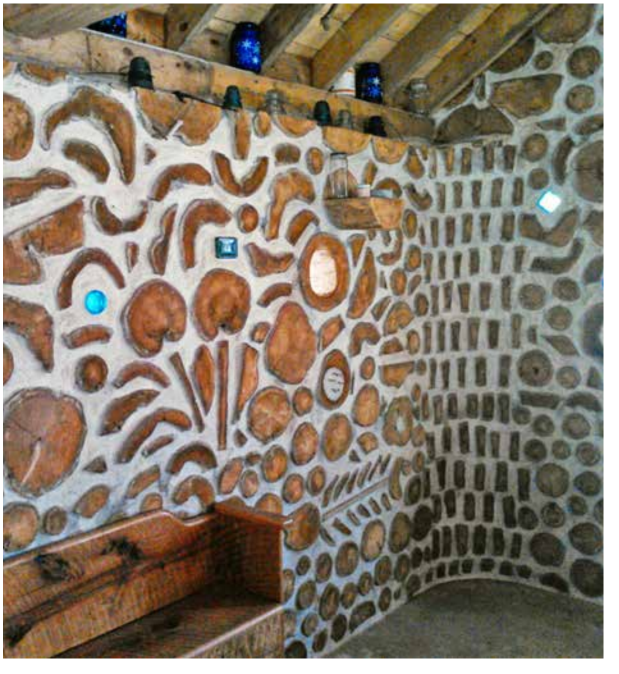
Although windows can be framed by the timber frame, as in Figures 1.13, 1.14 and 1.16, heavy frames—called "window bucks"—can also be floated in a cordwood wall, like the diamond-shaped ones in 1.15. The technique is explained in Chapter 3.

Summation

When I step back and hear myself lecturing on the three methods of using cordwood masonry, I realize that I am biased towards cordwood as infilling within a timber frame. We like round buildings—we have several—but they are best done under a protective cover. The stackwall corner's downsides seem to outweigh its upsides. In a seismic zone, the timber frame method is the only safe route. If you decide on stackwall, consider these three points very carefully: (1) Use Lomax Corner units. (2) Treat sawn (or split) quoin edges with a good waterseal. (3) Allow an extra 20 to 40 percent more time to build.

Finally, Lonnie J. Sobeck, of Coleman, Wisconsin, presenting at CoCoCo/15, developed a new cordwood building method which combines curved and straight walls with something he calls "bull-nose corners." His paper, "Bull Nose Cabin," appears in *The Continental Cordwood Conference Papers 2015*, along with 24 others. The collection is available from Earthwood Building School, cordwoodmasonry.com.

1.17. Lonnie's 20-foot by 24-foot Bull Nose Cabin, Coleman, Wisconsin. Credit: Lonnie Sobeck.



1.18. Interior of Bull Nose Cabin. Note that the corner logs have all been tapered. Credit: Lonnie Sobeck.

Bull-nose Corners

Lonnie is the only person I am aware of to use this method in a load-bearing structure, although Jaki and I wrapped similar bull-nose corners around a timber frame at a La'akea Community Cordwood workshop on Big Island, Hawaii.

1.19. Tapered logs at the corner, with barbed wire reinforcing in the mortar joint for extra strength. Credit: Lonnie Sobeck.

1.20. Exterior view of a “mini” bull-nose corner, wrapping around an *ohia* post in a timber-framed home in Hawaii. Small log-ends and chunks of lava helped fill large mortar joints.

1.21. Interior view of the home in Hawaii. The timber frame protected the workshop participants—and the cordwood—in a location with about 100 inches of rain per year.