Construction Methods

Above:
Milled log construction with all logs, in this case, a uniform 9" diameter throughout the home. In this application, all logs have undergone a secondary drawknifing process for a more unique look.

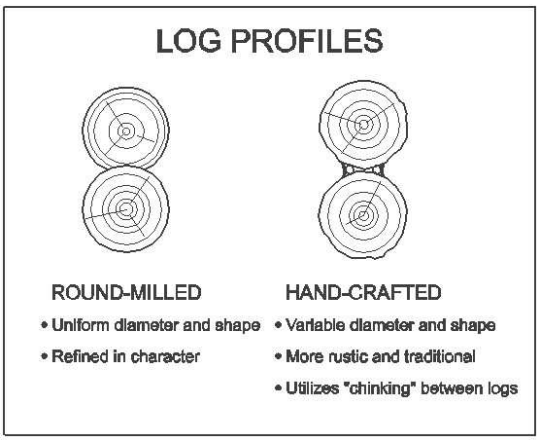
Left:
Handcrafted logs prior to chinking application. All corners are hand-notched as each log is unique in size and shape.

What construction methods are offered?

Two log construction systems are offered (see images, left page and profiles, right). Hand-crafted, chink-style log homes utilize logs in their most natural state. The bark is removed from the logs, either by pressure-washing or drawknifing, log corners are hand-notched, and chinking is applied between the log courses to seal the home. This is considered the most traditional of building methods and displays a mildly rustic, charming appearance.

Round-milled logs, on the other hand, undergo a milling process whereby the logs are machined to a consistent diameter throughout the length of the log. A full-bearing Swedish cope is also manufactured allowing the logs fit snugly together, eliminating the need for chinking. Such logs often undergo a final step of hand-peeling to provide a slightly more rustic appearance.

Should budget or aesthetic preference dictate a solution other than a log home in it's purest sense, a Hybrid home acts as a viable and, sometimes preferable, solution. Such homes are, essentially, conventionally-framed with the introduction of log or timber structural or architectural elements. Such a method can introduce a more diverse palette of materials including stone or Cedar siding.



What type of logs do you use?

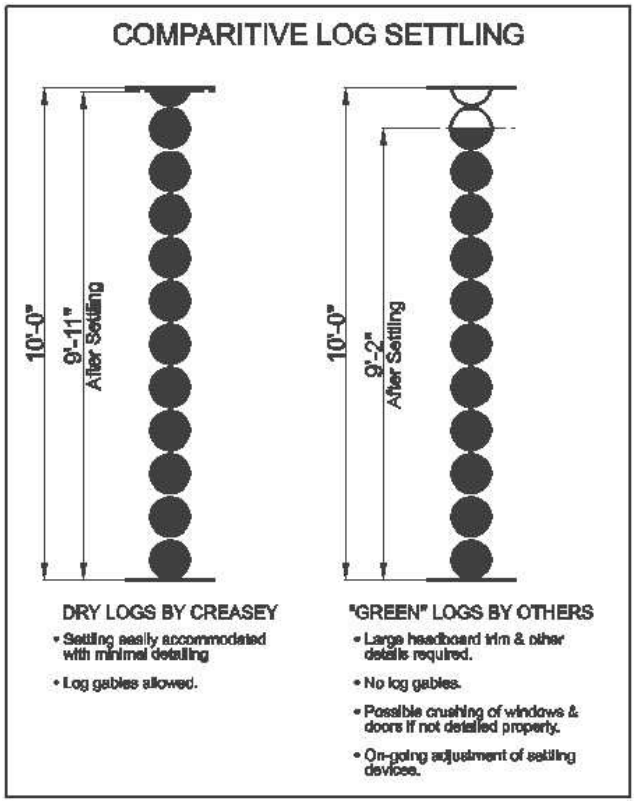
We use dry, dead-standing Lodgepole Pine from Eastern Washington, Idaho, and Montana. Dead-standing logs are the highest quality logs you can get. These are logs that have been standing dead in a forest for possibly 3-5 years or more before harvest. They have been killed by insects or flash forest fire, but the structural and aesthetic integrity remains intact. Sap and moisture are progressively drained from the tree throughout the drying period since the log seasons in an upright position.

"Dead-standing logs are the highest quality logs you can get."

Most other types of logs are generally "*Green*"; another way of saying they have a high moisture content. When wet wood dries out rapidly it can shrink too fast causing cracking, turning, and twisting. That's a big issue when the main ingredient in a log home is the logs. You won't have any of those problems with our logs as you enjoy your new home.

How much do logs shrink?

Shrinkage is one of the most important considerations when deciding upon a log home. In a 10' high wall there might be approximately 1" of settling in a dry log home. We can easily accommodate this by proper design and construction techniques like settling spaces above windows and doors and other methods. With minimal shrinkage like this we can offer full log gables. A green log home might settle



A "green" log home may settle as much as 10 inches in a 10-foot tall wall. Comparitevly, the same wall built with dry, dead-standing logs might settle an inch.

What is chinking?

Chinking is a sealant that is placed between courses of logs in a handcrafted home. We use a product which is an acrylic, highly elastic and adhesive chinking material, manufactured by Permachink, one of the most respected companies in the industry. It is applied over a foam backer rod and "slicked" with specialized tools so it bonds with the logs. It is not concrete. It does, however, have a gritty texture that resembles, to some extent, concrete or mortar. Further, Permachink chinking is available in several colors. The durability of chinking is immense and, often, can be expected to last the life of the home.

Below: A handcrafted log cabin with chinking.

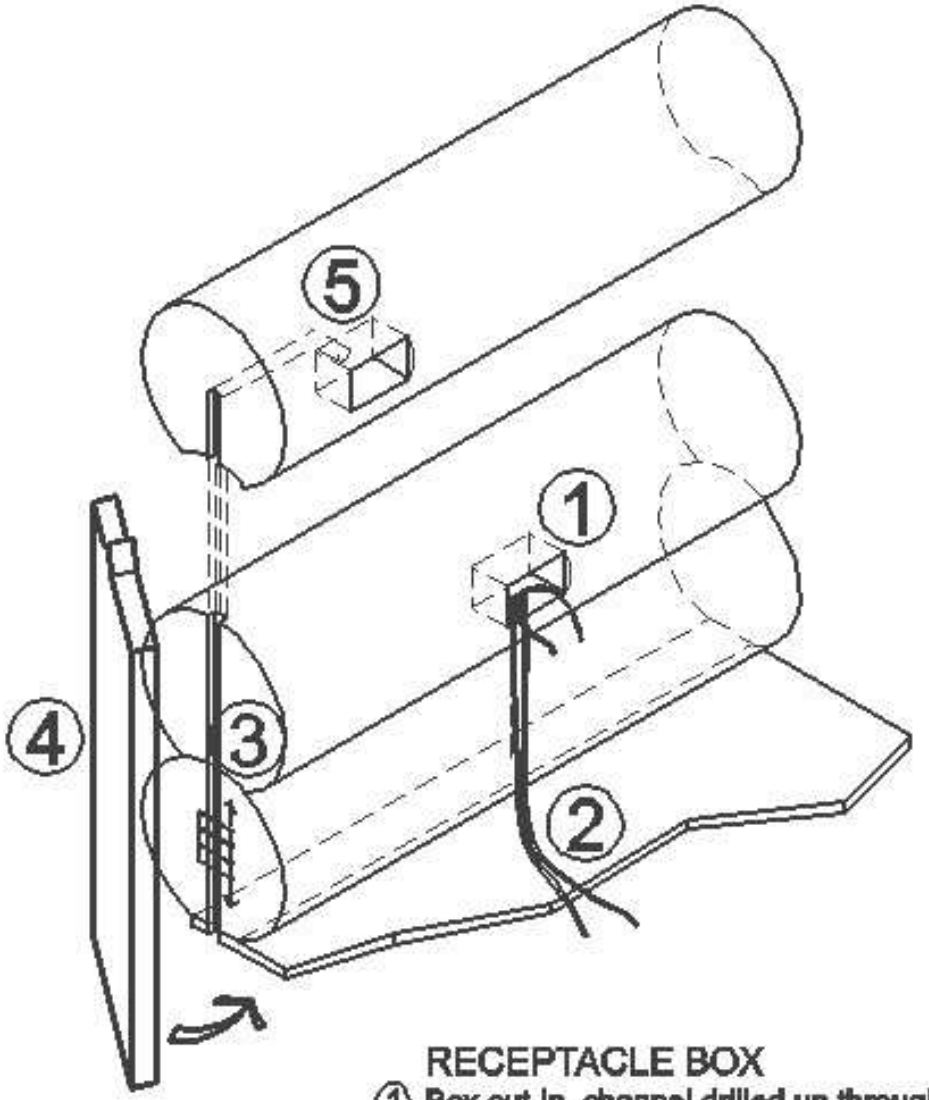
How are the logs secured together?

Our milled log homes are fastened with long, specialized screws at a spacing determined by structural engineering review unique to each home. These screws are high-strength, do not require the drilling of a pilot hole, and are easy to install. Because of these benefits, they often find their place in our handcrafted homes as well. However, hand-crafted log home assembly can frequently require extra, initial, driving power and, as such, we incorporate large spikes where necessary to better align or position such a log.

"Log Boss" screw by PermaChink Systems. **Right:**

Below: A handcrafted log cabin with corner spiking..

ELECTRICAL RUNS



RECEPTACLE BOX

① Box cut-in, channel drilled up through logs

② Wiring pulled-through by electrician at rough-in

SWITCH BOX

③ Jamb cut-in at door opening with protective metal plates

④ 2x10 door buck

⑤ Box cut-in for switch

Where does the wiring and plumbing go in a log home?

We frame almost all interior partitions, allowing all of the utilities to be incorporated as usual. Should plumbing fixtures be located against exterior log walls, a route is always planned to allow drains and vents vertical access through a framed wall in close proximity.

However, electrical codes, as well as convenience and common sense, dictate that receptacle outlets and light switches near exterior doors will be required even within an exterior log wall. In the case of switches, wiring is provided a vertical channel behind door bucks (the boards that create a rough-frame for a door to attach to in a log wall) from the floor to the switch height. From there, a route is drilled endwise into the log to the switch location and a rectangular cut-out provided for an electrician to install a standard electrical box. The outer face of the round log is flattened at the location of the box to allow the final placement of the trim plate.

Receptacle outlets are similarly handled. Prior to placement of the first log courses, a walk-through is scheduled with the owner, contractor, and electrician and outlet locations are marked on the floor per a previously developed electrical plan. The subfloor as well as the first two log courses are drilled at these locations prior to installation, and a box and faceplate detail similar to the switches provided.

In either case, the end product is well detailed and no exposed conduit is involved anywhere. All the electrical contractor has to do is pull wire, install the boxes, make the connections, and apply the faceplates.

- **Cut-ins are made in logs where receptacles or switch boxes are indicated.**
- **Access to the boxes are provided with drilled chaseways.**
- **Wiring is later pulled by the electrician and electrical boxes placed.**

Light switch box cut-in. **Right:**

What is the relative energy-efficiency of a log home?

The Washington State Energy Code essentially provides us with an equivalent R-value of R-19 when the primary heat source is other than electric resistance. In a log home, R-value is actually not the most important measure of thermal retention. That property is called **"Thermal Mass," the ability of a material to retain heat within it and release it slowly over a period of time.**

Traditional adobe structures in the American Southwest utilize this property. During the extreme heat of the day, the interior of these homes remain cool as heat builds up in the thick walls. As evening approaches and the air temperature cools, the heat energy finally overtakes the heat capacity of the wall and begins to be slowly released into the room, warming it. As such, interior room temperature remains relatively constant. The same is true with log homes.

The government has also commissioned studies comparing annual heating and cooling energy consumption with conventional-framed homes. The end result is that, properly constructed, a log home will perform as well as conventionally-framed homes.

RESEARCH REPORT ON ENERGY EFFICIENCY OF LOG HOME BUILDINGS

Credit: Bitterroot Valley Log & Timber
2036 US Hwy 93 N. - Victor, MT 59875 (406) 642-3091

Margaret Lowe, in her article entitled "Myths and Truths of Log Home Ownership" addresses the efficiency of Log Homes.

She wrote: "Myth #1: Log homes are not energy-efficient: FALSE, in capital letters. Early in this decade, the nation's model energy code finally recognized what the log home industry had claimed for 20 years -- that a log wall's thermal mass makes it as energy-efficient as a well-insulated wall. This claim wasn't acknowledged during all those years because thermal mass is difficult to quantify. Log home owners had the heating bills to prove it was true. But, the Department of Energy and national code officials needed more than empirical evidence. So for 13 years the Log Homes Council (a division of the National Association of Home Builders in Washington, DC) gathered scientific statistics from independent research projects to substantiate its claim.

"At the heart of the debate were R-Values, the measure of heat transfer through materials. When the energy crisis struck in the mid 1970's, state and federal governments had to quickly develop new energy-performance standards for residential construction and all the building materials used in that construction. Since the situation was a crisis, and the R-value methodology already existed, it became the standard, no questions asked.

"R-value measures a material's resistance of heat from one side to another. Log's have a relatively low resistance to heat transfer. In fact, they actually absorb and store heat in their cellular structure. This puts them at a serious disadvantage in the cold weather states. Producers had to overbuild their houses in order to meet total R-value requirements. This not only drove up construction costs, it also created a lot of confusion.

"The opposite of R-value, thermal mass, measures a material's capacity to absorb, store, and slowly release heat over time when temperatures drop. Logs do this very well because of their cellular structure, bulk, and thickness. The problem, was proving it.

"An early breakthrough came in studies conducted by the National Institute of Standards for HUD in 1981-82. The studies proved thermal mass does significantly reduce heating and cooling loads in moderate climates. However, energy experts continued to question the value of thermal mass during the winter months in northern climates where heat is a constant need (or during summer months in southern climates where cooling is in need) and thermostat settings are opposite of outdoor temperatures.

"Two more recent studies, both conducted in cold climate states, proved the log home industry was right.

"In 1990, an independent testing agency, Advanced Certified Thermography, conducted a study for the Energy Division of the Minnesota Department of Public Service. Its focus was heat loss through air leakage, which was assumed to be a special problem with log homes because of their many joints. The study found the industry's improved joint construction and its use of expanded foam sealants and gaskets at joints and corner intersections had substantially reduced air infiltration rates. The study concluded air leakage in a well-built, modern log home is not due to its log walls. In fact, in the 23 homes studied, it found air leakage occurs in the same places it occurs in conventional frame homes: at the top of cathedral ceilings, around window and door frames, and along the tops of walls where they join the roof.

"A second study, conducted in 1991 for the Log Homes Council by the National Association of Home Builders (NAHB) National Research Center, discovered the thermal mass of log walls does significantly reduce energy use for heating in cold climates. It based its conclusions on a comparison of actual energy use in eight log homes to the actual energy use of eight well-insulated frame houses during one winter. The 16 homes were evenly divided between upstate New York and Montana. The study also compared the homes' actual energy use to their predicted energy consumption. **The results led to the conclusion that log homes were as energy-efficient as well-insulated frame houses.** What is especially significant about this study is that the average R-value of the log walls was 44 percent lower than the average R-value of the frame walls. Obviously, the thermal mass performance of log walls is an advantage to log home owners."

According to an article by Peter M Hart of New England Log Homes: "the oft-cited R-value (resistance) factor is meant to be a measure of heating efficiency but actually, that concept is both inaccurate and misleading. As an example, an illusion is created to convey to the homebuyer that if three inches of fiberglass is good, then six inches is twice as good and naturally, 12 inches is four times better.

"The results led to the conclusion that log homes were as energy-efficient as well-insulated frame houses."

"NOT SO! After a certain amount of insulation has reached optimum, the overage of insulation is waste and does not justify the additional cost.

"To arrive at the R-value of a particular type of insulation, heat is passed through the material by conduction, under fixed temperatures and only when the material is completely dry. No consideration is given to convection, radiation loss, solar input, heat and storage capabilities and the influence of moisture.

"For instance, a test of fiberglass sample rated R-13 when dry is reduced to R-8.3 when conditions reach a moisture content of 1.5% -- a loss of 40% insulation efficiency." These R-value standards were determined under unrealistic conditions due to the fact that we all live in a humidity-laden atmosphere. This humidity level is compounded in the home environment.

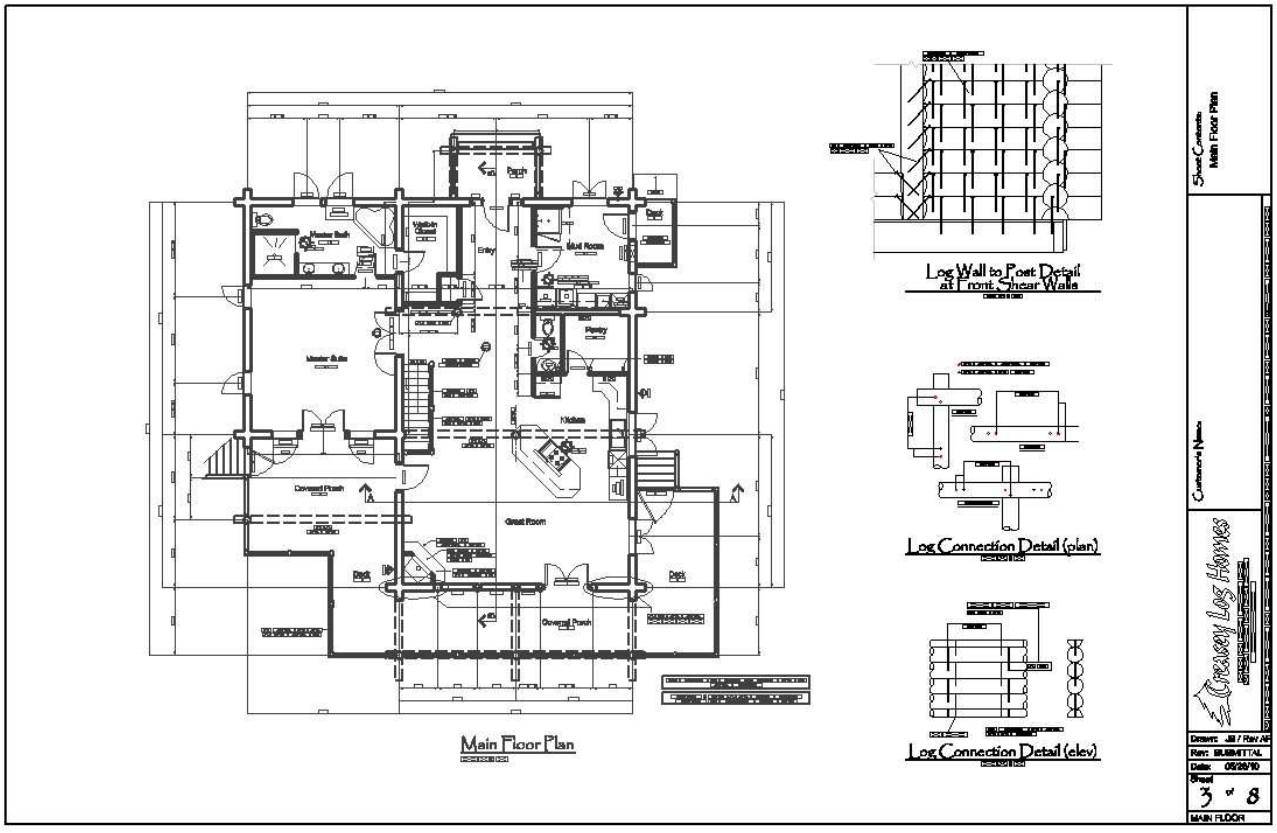
What types of construction packages do you offer?

In addition to the option of log system, our customers have a choice when it comes to the selection of a construction package. In a Closed-Shell package, Creasey Log Homes is contracted to clear and excavate the site, construct the foundation or basement, install the floor frame, supply and erect the log package, complete the roof framing, and install all exterior finishes such as roofing, siding, windows, and doors. The customer may then personally subcontract or perform any of the finishing work at their own schedule and typically at a lower cost.

For those with neither the time or desire for project management through the completion of their home, we offer our Turnkey package. Our customers can rest assured that their home is being managed with the highest expertise and with pre-approved subcontractors and suppliers familiar with our high standards.

What about design and construction plans?

Where needed, Creasey Log Homes can perform design service in-house or through one of our reputable design team associates. The unique requirements of log home design needs to be handled skillfully and not left to chance. In addition, structural engineering review, permit documents, and any number of other pre-construction services are available.



Do you allow owner participation?

We will allow you to do as much or as little as you would like to do to save costs as long as your involvement does not impair our efforts. If one of our clients is considering a significant amount of involvement, we recommend going with a Closed-Shell contract. That way, our work can go unimpeded through some of the most critical aspects of the build. We could then offer consultation or individually contracted services, as needed, during completion.

How does a log home perform in a fire?

Typically, all that is seen after a fire is smoke damage and possibly some surface charring where sustained exposure to fire has occurred. This is because of the mass of logs. The same home, conventionally framed might be consumed or experience total structural failure. Our company has experience in restoring log homes that have smoke or fire damage.

Above: Home structurally intact after fire.

Are log homes difficult to maintain?

It's not so much that log homes are more difficult to maintain, it's simply that your logs are not only an architectural shell but the permanent structure of the home. Wood, as a material, needs a little extra care regardless of whether it is siding or log wall.

Logs should be kept clean so that mildew has no chance to establish itself in a grime build-up. We recommend a light pressure-washing with wood cleaner every 2 years (annually is best), a new topcoat Log Finisher within 2 years of a first application over bare wood, and a re-application of every 3-5 years depending on the weather exposure of the walls. This is relatively aggressive compared to other sidings, but will serve to maintain the beautiful appearance and structural integrity of your log home.

Generous roof overhangs, properly installed and functioning gutters & conveying systems, and vegetation that is pruned away from the logs will greatly extend the life of your finish.

How do you finish the logs?

We prefer to use "Log Finisher" by Forrest Paint Co. which is an oil-based preservative. It is preferred to latex stains for it's deeply penetrating ability and ease of future re-application. The Exterior Log Finisher will soak into the wood providing excellent
exterior durability and will bring out the natural beauty and definition of the wood grain. The rejuvenating property of the resin/oils allows protection of the surface wood cells with gradual erosion over time. The product is formulated to contain special UV Absorbers, Light Stabilizers and a Water Repellent to further protect the wood from the harmful affects of sunlight and moisture. Exterior Log Finisher will retard fungal growth, mildew and blue stain. The product has proved it's durability to us through decades of application by our crew.

Log Finisher typically requires a two-coat application and is back-brushed to prevent runs. We often use Log Finisher on the interior surfaces, as well, but with a one-coat application to keep the appearance lighter, and with an interior clear sealer coat applied over the top. We have commissioned our unique color, Honey Teak, which has a warm, rich hue.

Below: Our Honey Teak Log Finisher application.

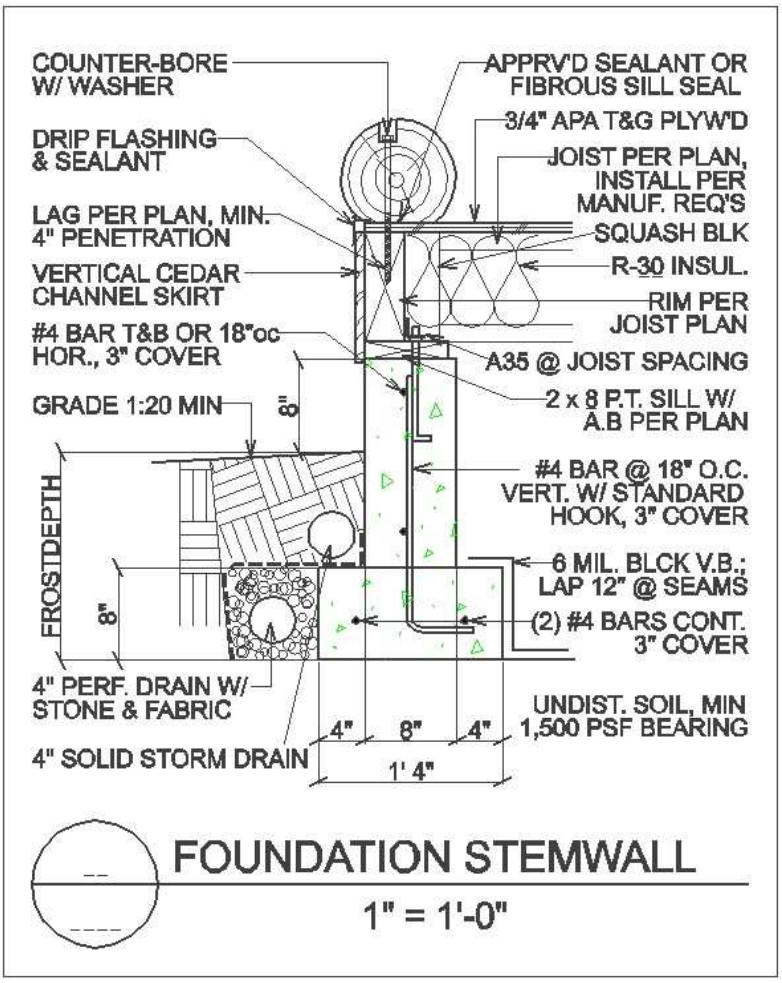
What do you use for a foundation?

Our foundations are similar to a conventional two-story home with an 8” wide stemwall on a traditional footing. In fact, the main floor framing system is similarly conventional. Typically, the only difference is the introduction of a rim beam, instead of a rim board. The beam, often a dimensionally-stable Parallam brand, or similar, engineered product ,serves as the member that sill log screws are fastened to.

A high percentage of our homes are built on walk-out basements. We employ the use of a wall waterproofing membrane in conjunction with drainage mat and perforated footing drain with discharge outlet to convey sub-surface water away from the basement.

Below Left: Standard crawlspace foundation stemwall. Note the use of the Rim Beam and how the sill log is fastened.

Below Right: Freshly-poured basement walls with water-proof coating applied, footing drainage installed, and ready for drainage mat.



What type of roofing do you use?

Roofing is based on owner preference. We do typically see a slightly larger application of standing-seam metal versus architectural composition roofing. Factors to consider are initial cost, expected life, municipal fire-rating requirements, and effects on insurance. In terms of warranty, many architectural composition roofs are realistically providing a performance comparable to metal.

Above Left: Composition roofing.
Above Right: Standing-seam metal.

How long will it take to complete my home?

Time required will vary with building design and jurisdiction. Design can take from 2-4 months, the permit process can take 1-4 months or more depending upon jurisdiction, and construction usually takes 6-9 months for a turnkey package (depending upon size, complexity, etc). A Closed-Shell package can realistically be completed in about half the time of a Turnkey contract.

Do you offer kit packages?

We have started to develop a series of kit cabin packages to provide affordable, pre-designed solutions to our valued customers. Several models, variations, and options are offered. Log kits are pre-notched and individually marked for re-assembly. For smaller models, full material packages are available. The kit is loaded and shipped to your site for your General Contractor or, if your site is local to us, we can be hired to construct as well.