

According to the Log Home Living Institute, the annual production of log homes has increased by over 40% since 1988 and represents about 6% of the custom built home market. There are currently over 400,000 log homes, of various sizes and styles, in the U.S. and Canada. Crafted or custom built homes account for 25% of the total production while kits account for 75%.

This type of home is built with logs instead of studs. It is a method of construction, not the style of house that distinguishes log homes from typical wood framed house. The logs are secured with spikes, lag bolts or **through-bolts**—placed every 4' to 6', at corners and at either side of opening. Their function is to secure the wall from the foundation to the top plate. Unless half-log systems are used, in which case a wood frame is required and the logs are simply a veneer. Construction techniques such as large roof overhangs, special corner notches, and improved organic sealants are used to shed water away from the perimeter, reduce water penetration and protect logs from insects and fungal decay.

Due to the inherent **thermal mass** characteristics of the log walls (log sizes range from a width of 6" to 15"), many of these homes are as energy efficient as conventionally insulated walls. In fact, according to the Log Home Council a *"log wall's thermal mass makes it as energy efficient as a well-insulated frame wall"*. Thermal mass is a material's capacity to absorb, store and slowly release heat over time. This is achieved by the log's cellular structure, bulk and thickness. As a result, log walls provides significant energy-savings because the absorbed heat is slowly released back into the house.

Many advances have been incorporated into the construction of log homes. This includes an advanced tongue-and-groove system between the logs, improved joint construction through the use of expanded foam sealants and gaskets (In the past, log joints were sealed by **chinking**—a mortar mixture plastered over some kind of filler), longer lasting wood preservatives and drying logs as much as possible prior to assembly to minimize shrinkage (typical moisture content of logs is between 8% to 19%).

Most of the heat loss occurs through air leakage similar to conventional wood framed houses—at the peak of cathedral ceilings, around windows and door frames and along the top of walls. Most log homes are not constructed with conventional vapor barriers, the natural wood allows the transfer of moisture to the outside through **vapor pressure**—the force that slowly pushes water vapor through solids to the drier side. Problems such as mold growth can occur if this process is restricted or overwhelmed. As with most homes, humidity levels and points of water entry must be minimized.

## **MAINTENANCE OF A LOG HOME:**

- CHECK BETWEEN LOGS FOR GAPS TO MINIMIZED COLD AIR INFILTRATION, CONDENSATION AND MOLD GROWTH
- USE CAULKS, FOAMS AND CHINKING MADE OF ELASTIC CHEMICALS THAT ALLOW FOR MOVEMENT AND REDUCE TEARING AND BREAKING
- KEEP LOWER COURSE LOGS ABOVE FINISHED GRADE—EARTH TO WOOD CONTACT ENHANCES THE CHANCE OF COLONIZATION BY TERMITES AND DECAY FUNGI
- APPLY FLASHING AS DRIP CAP OVER WINDOWS AND DOORS TO MINIMIZE WATER ENTRY
- PROJECT ROOF OVERHANGS A MINIMUM OF 18" WHICH MOVE ROOF RUNOFF AWAY FROM THE LOG WALL SURFACE AND PROVIDE THE BENEFIT OF SHADING THE WALL FROM THE SUN AND ULTRAVIOLET RAYS
- APPLY SEALANTS THAT INCLUDE FUNGICIDES, MILDEW INHIBITORS, ULTRAVIOLET INHIBITORS PERIODICALLY (DEPENDING ON THE CHEMICAL, WOOD AND ENVIRONMENT, MOST SEALANTS LAST 2 TO 5 YEARS)
- ADEQUATELY VENT CRAWLSPACES TO PREVENT THE ACCUMULATION OF MOISTURE FROM WITHIN THE LIVING SPACE AND FROM EXPOSED EARTH FLOORS
- UPPER FLOORS MAY BE OUT-OF-LEVEL DUE TO WOOD SHRINKAGE—ADJUSTMENT IS TYPICALLY REQUIRED IN THE YEARS RIGHT AFTER THE HOUSE IS BUILT (AFTER ABOUT 5 YEARS, MOST SETTLING HAS TAKEN PLACE)
- PERIODICALLY INSPECT THE PERIMETER OF THE HOUSE AND JOINTS FOR PEST INFESTATION AND TREAT AS REQUIRED (INSECT DAMAGE MUST BE MORE SEVERE THAN A CONVENTIONALLY FRAMED HOME TO CREATE A STRUCTURAL PROBLEM)



### Classic Swedish Cope Log Profile (saddle notch corner)

- ROUNDED EXTERIOR AND INTERIOR
- QUARTER MOON COPE
- LOG SIZES ARE TYPICALLY 7" TO 12" IN DIAMETER
- CHINKING IS NOT REQUIRED



### Square Log Profile (with Dovetail corner)

- FLAT EXTERIOR AND INTERIOR (WITH HAND-HEWN FACE)
- RECESSED MORTAR JOINTS FOR THE INSTALLATION OF SYNTHETIC LOG CHINKING
- LOGS ARE TYPICALLY 8" TO 12" IN DIAMETER



### D-Shaped Log Profile (with saddle notch corner)

- ROUNDED EXTERIOR
- FLAT INTERIOR
- DOUBLE TONGUE-AND-GROOVE
- LOGS SIZE ARE TYPICALLY 8" TO 12" IN DIAMETER

### Through-Bolt System

LOGS STACKED OVER THE ALL THREAD ROD AND ARE TORQUED DOWN AT EVERY THIRD OR FIFTH COURSE.

