

Timber Frames and Log Structures



Modern Timber Frame

Contemporary examples by Riverbend



Modern Timber Frame

Traditional structural framing usually with Douglas Fir or White Pine



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Timber Framing

John Pariseau barn 2015



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Timber Framing

John Pariseau barn



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Timber Framing

John Pariseau barn



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Timber Framing

John Pariseau barn



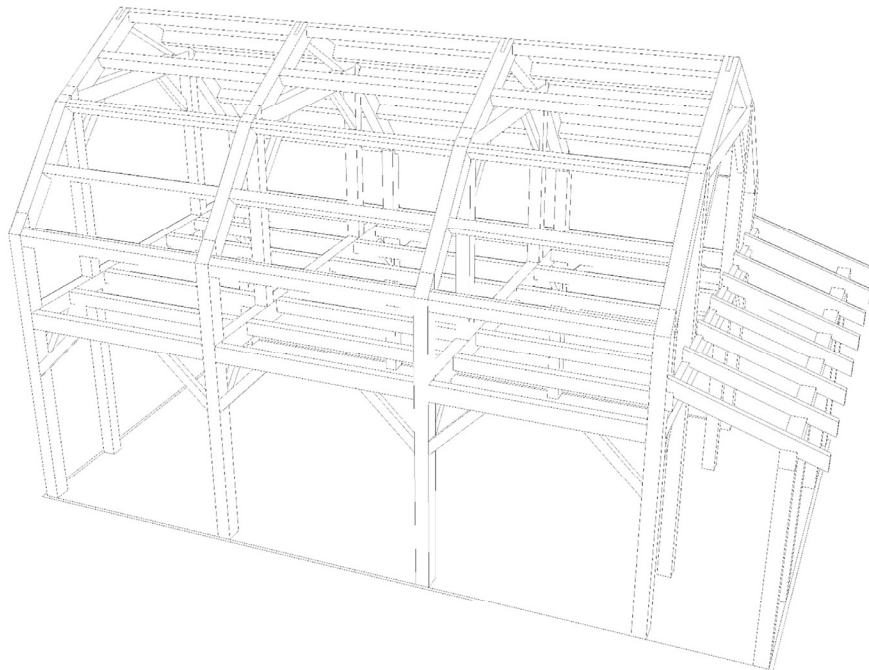
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Timber Framing

John Pariseau barn



Wanderlust Design
1115 W. Main St.
Plymouth, MI 48170

Pariseau Barn
Plymouth MI

ISSUE
7/23/15

DESIGNED BY
D.H.

a

02

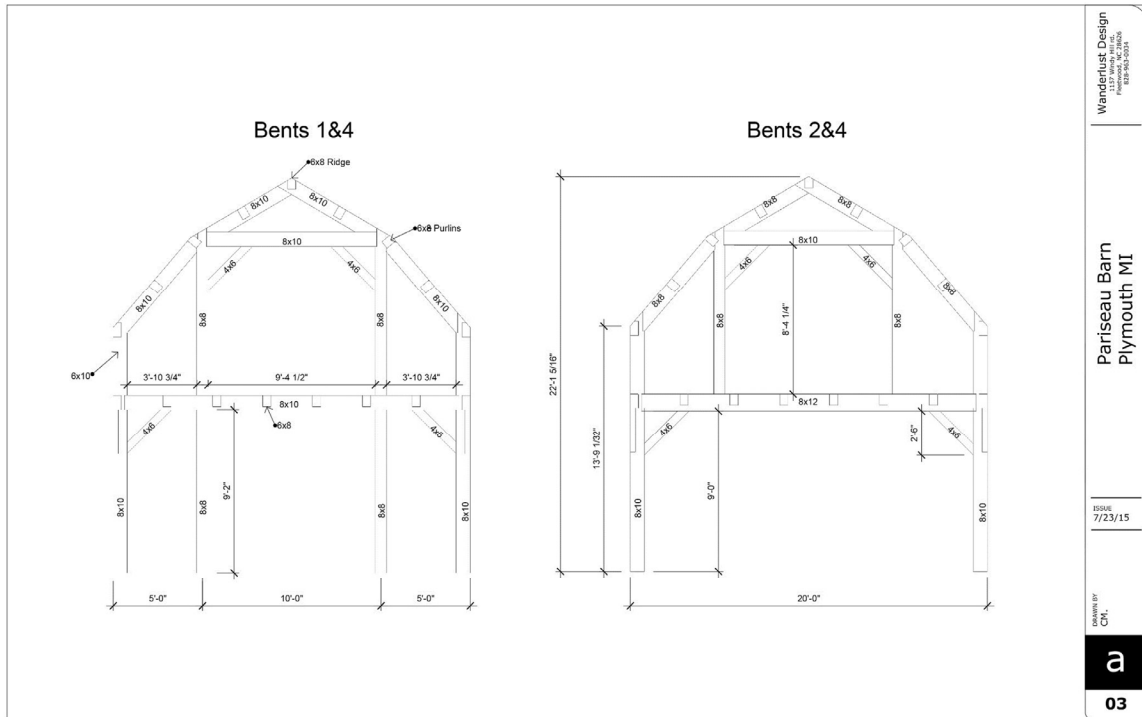
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John Pariseau barn



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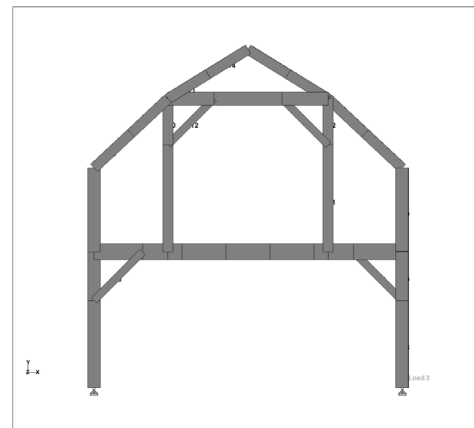
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Timber Framing

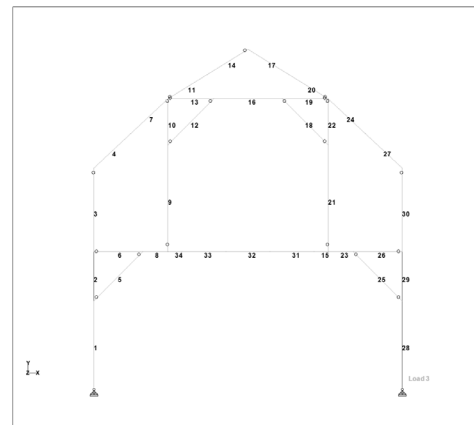
John Pariseau barn

Combination Load Cases

- 7 D
- 8 D+L
- 9 D+LR
- 10 D+S
- 11 $D+0.75L+0.75LR$
- 12 $D+0.75L+0.75S$
- 13 $D+0.6W$
- 14 $D+0.75L+0.75(0.6W)+0.75LR$
- 15 $D+0.75L+0.75(0.6W)+0.75S$
- 16 $0.6D+0.6W$



Sections



Utilization

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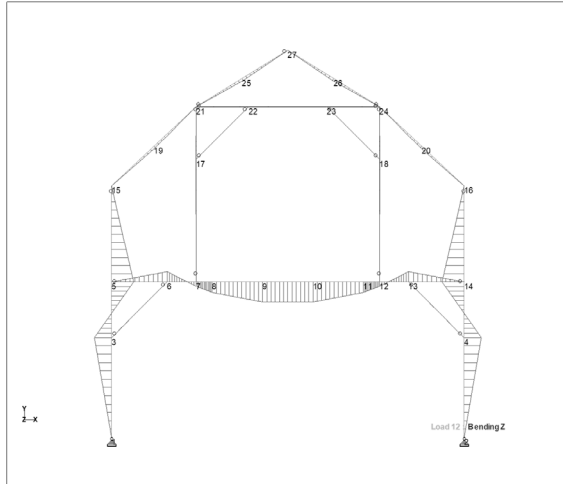
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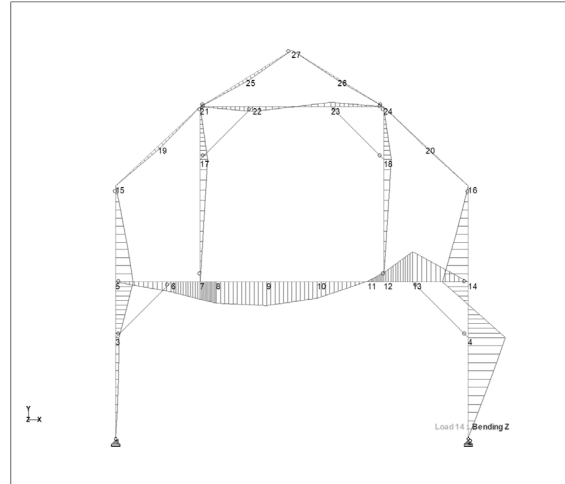
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Moment:



$D+0.75L+0.75S$

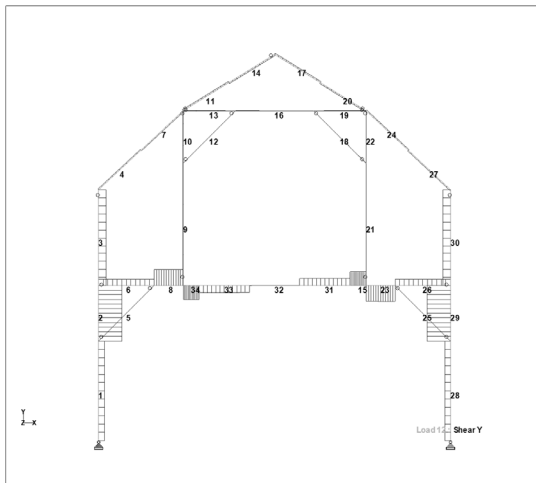


$D+0.75L+0.75(0.6W)+0.75LR$

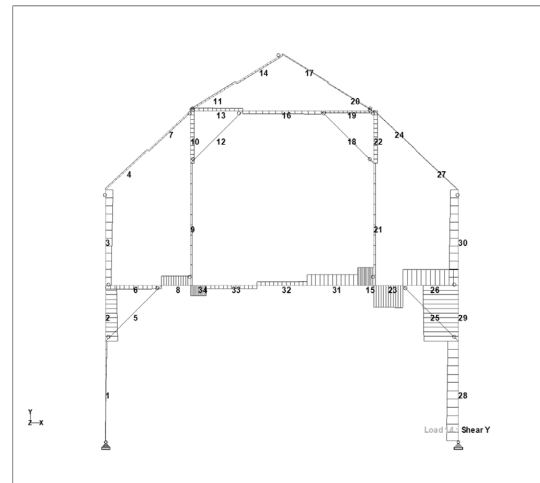
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Shear



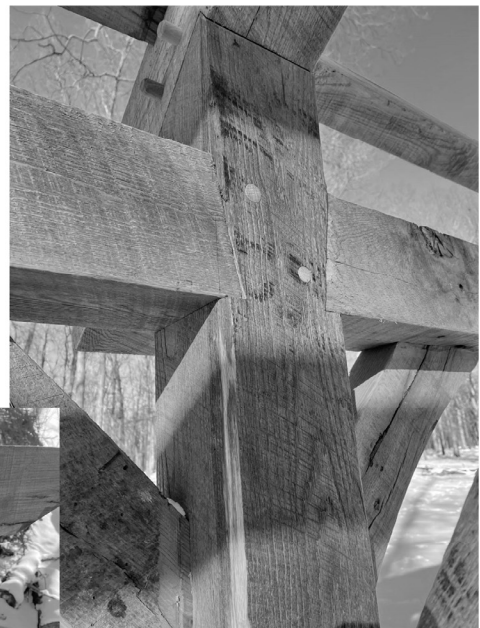
$D+0.75L+0.75S$



$D+0.75L+0.75(0.6W)+0.75LR$

Timber Framing

Charlie Carter barn



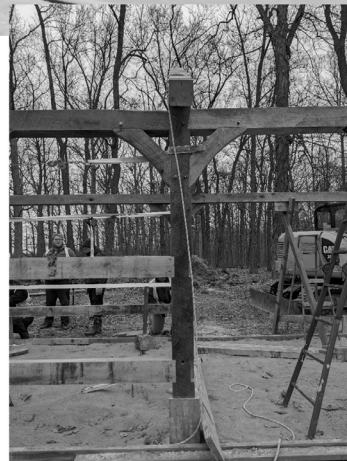
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Timber Framing

Charlie Carter barn



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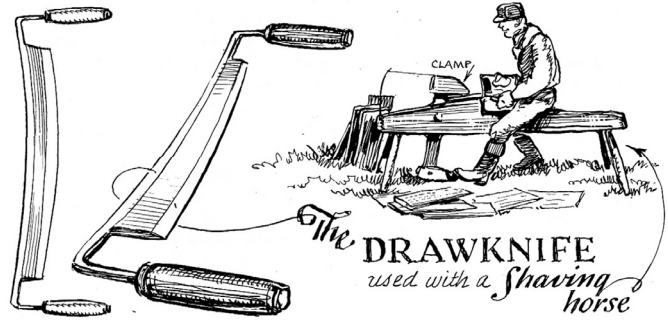
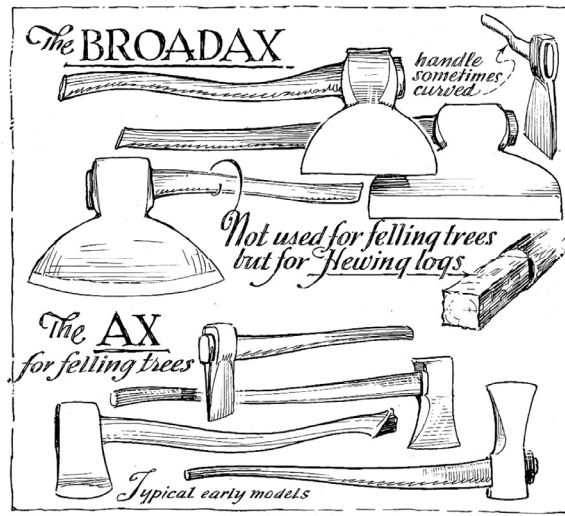
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Timber Framing

Tools



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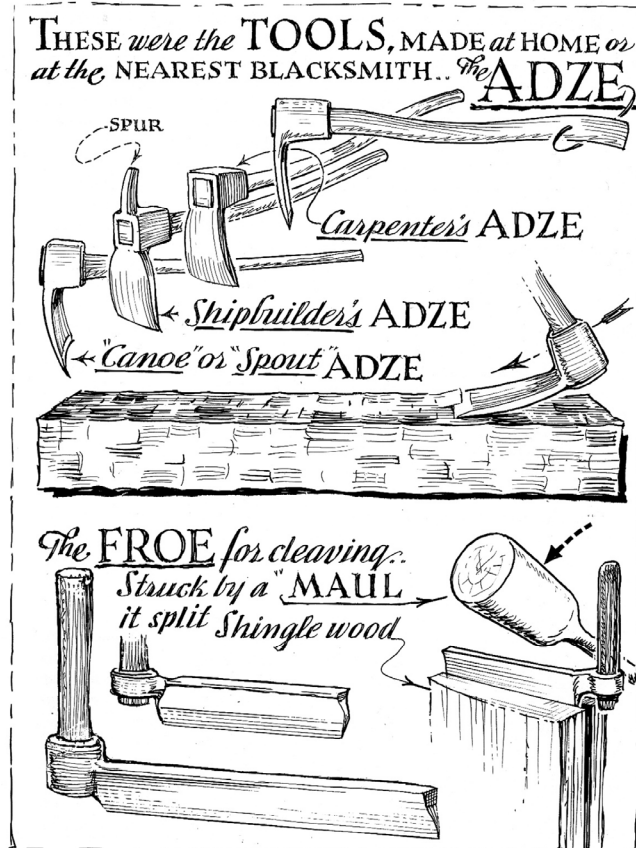
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Tools



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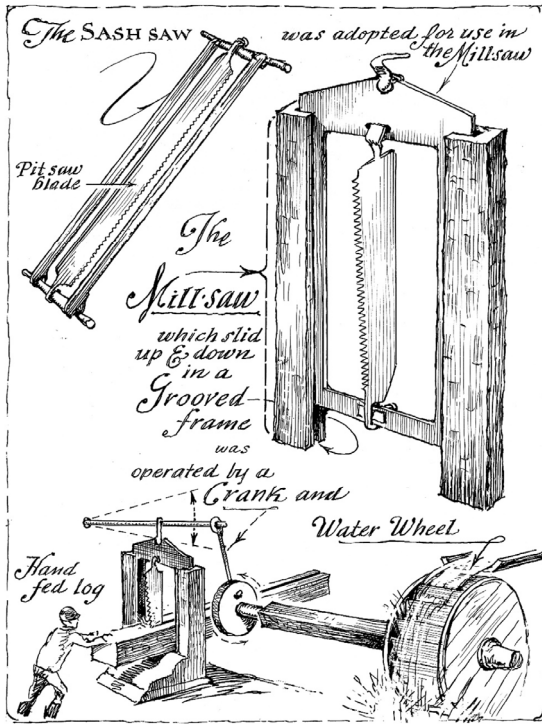


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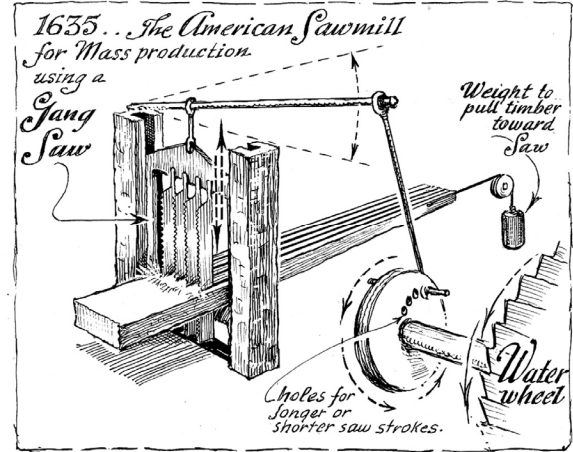
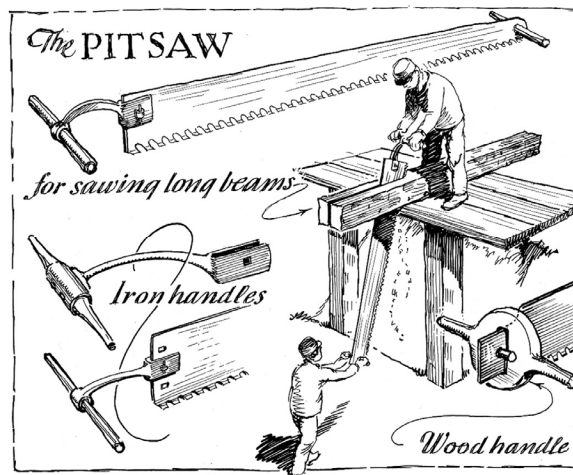
Tools



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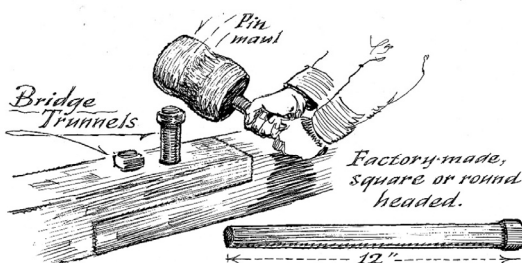
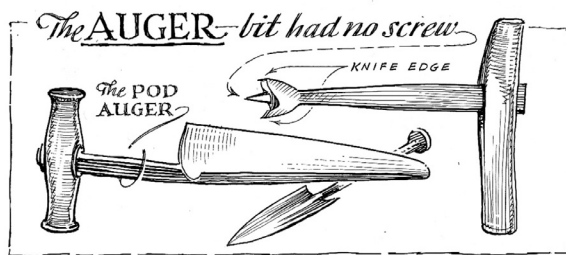
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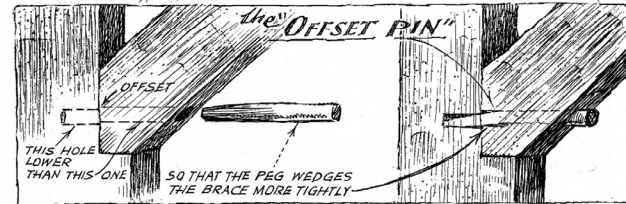
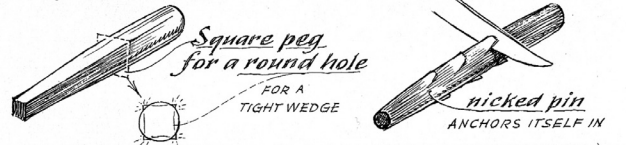


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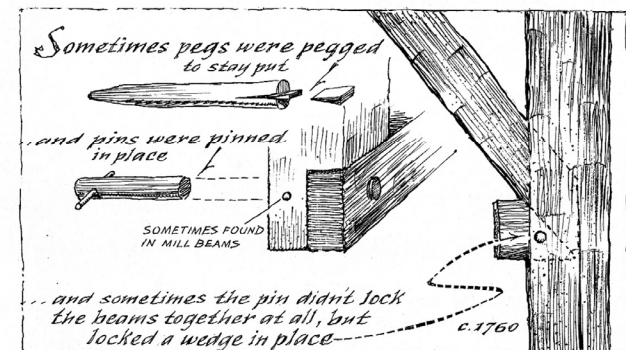
joinery



Ways of making a wooden pin stay put. (1700s)



Hammered while green, it stayed put tightly



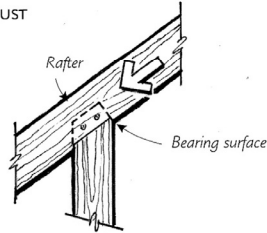
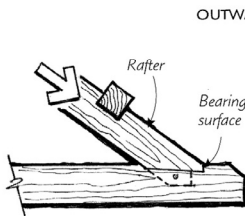
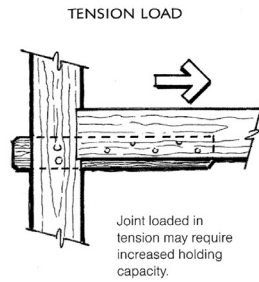
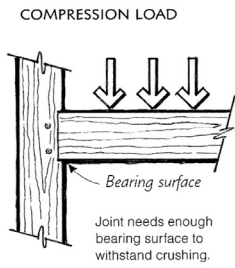
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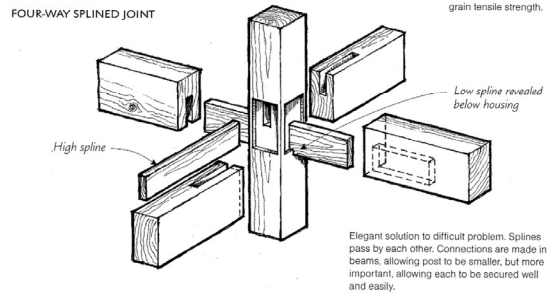
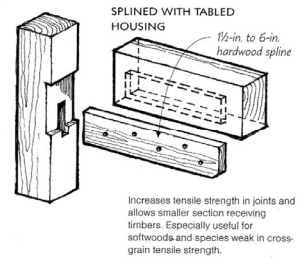
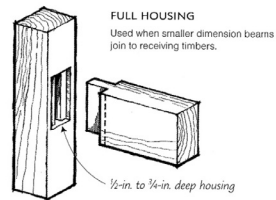
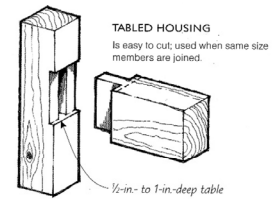
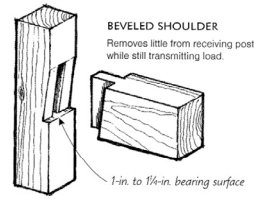
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Timber Framing

joinery



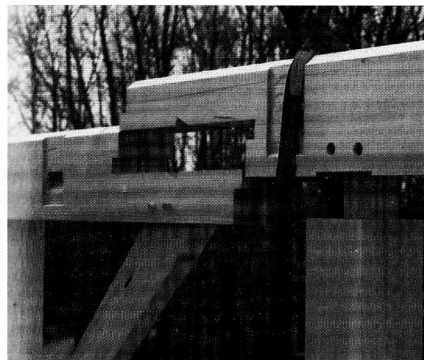
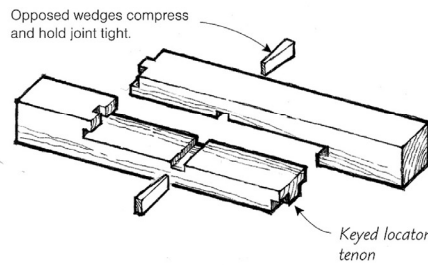
STRENGTHENING MORTISE-AND-TENON JOINTS



Timber Framing

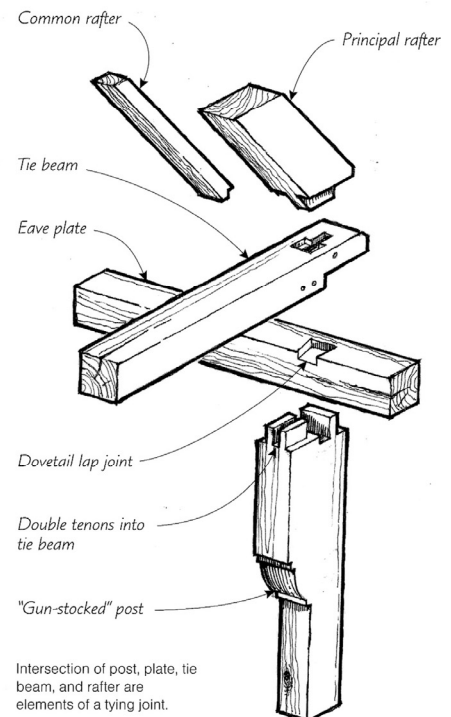
joinery

SCARF JOINT



The scarf joint can be very strong and beautiful. This example is keyed in two directions and will be locked with wedges. Note that the brace is positioned to help support the scarf. The wood is Sitka spruce.

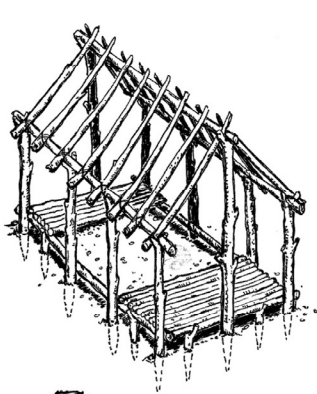
TYING JOINT



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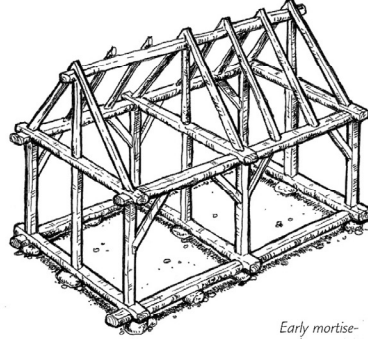
timber frame development

EARLY TIMBER-FRAME STRUCTURES

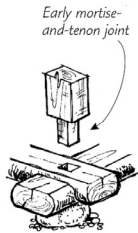


Early wood structure with pieces lashed together and earthbound posts. Rigidity arises from ground anchoring of the frame.

Sharpened wood post in ground

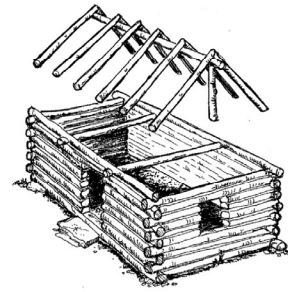


Bringing frame out of ground gave structure a longer life. It also required early builders to make stronger joints and develop structural resistance to loads.



Early mortise-and-tenon joint

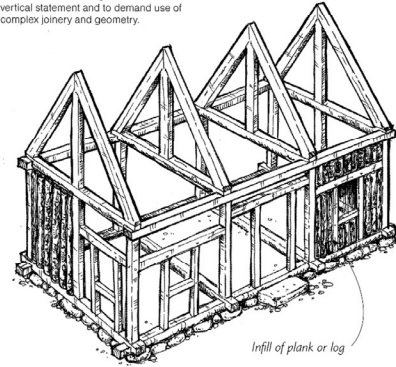
LOG HOME



Stacking logs is a more basic means of creating a structure, yielding a massive and earthbound look.

TIMBER-FRAME HOME

Timbered buildings in heavily wooded areas seemed to rise out of ground with more of a vertical statement and to demand use of complex joinery and geometry.



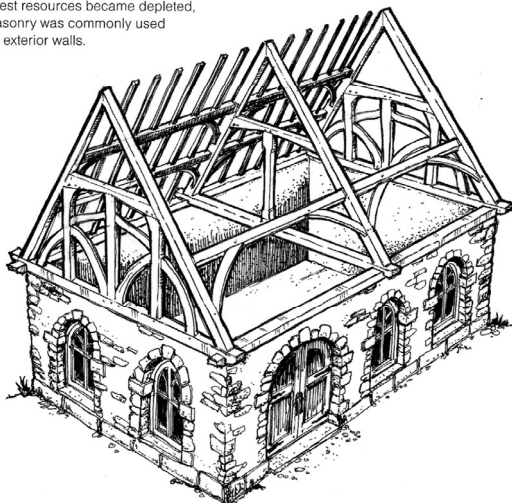
Infill of plank or log

Timber Framing

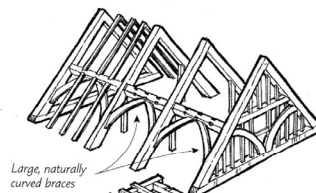
timber frame development

TIMBER-FRAME STRUCTURE OF THE MIDDLE AGES

Some of the greatest carpentry of all times is evident in timber-framed roofs of Middle Ages. As European forest resources became depleted, masonry was commonly used for exterior walls.

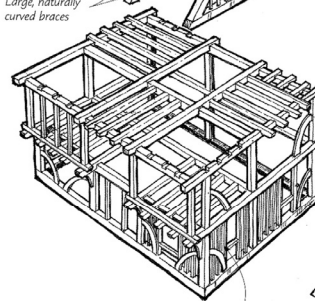


OLD ENGLISH-STYLE FRAME



Large, naturally curved braces

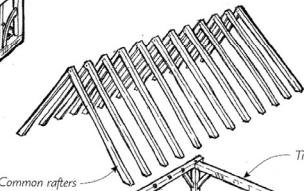
English framing made use of shorter length of timber, curved bracing, and many studs (some removed for clarity).



Close studding

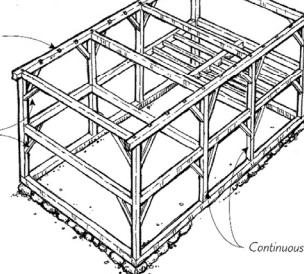
Colonial Americans developed style that featured long timbers for posts, plates, rafters, and tie beams. Frame design was pragmatic and spare in relation to English archetype.

EARLY AMERICAN FRAME



Common rafters

Tie beam



Long, continuous plate

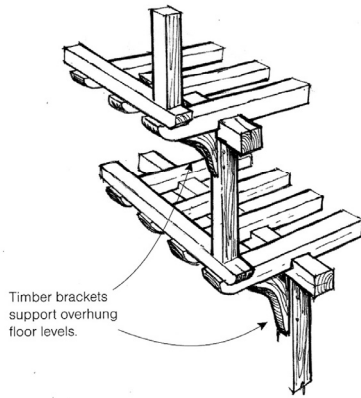
Simple bracing

Continuous posts

Timber Framing

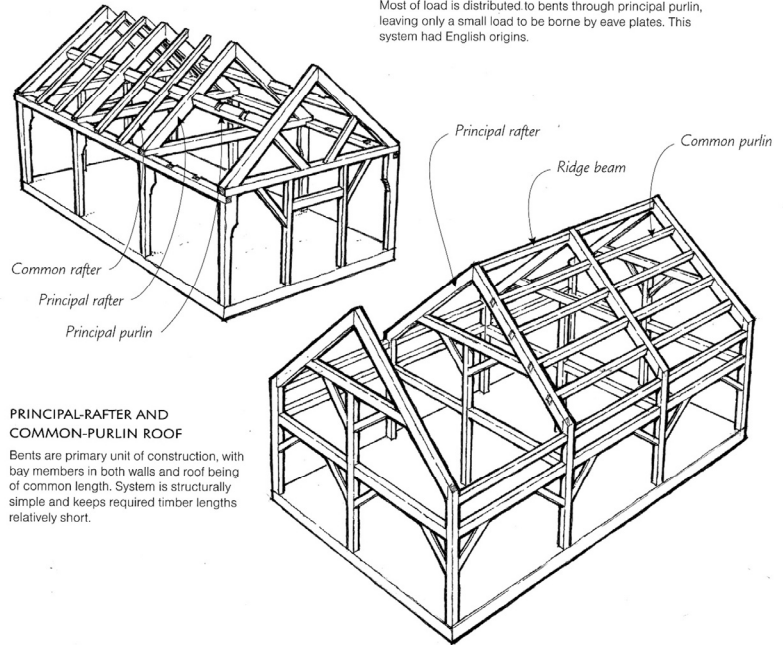
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BRACING THE STRUCTURE



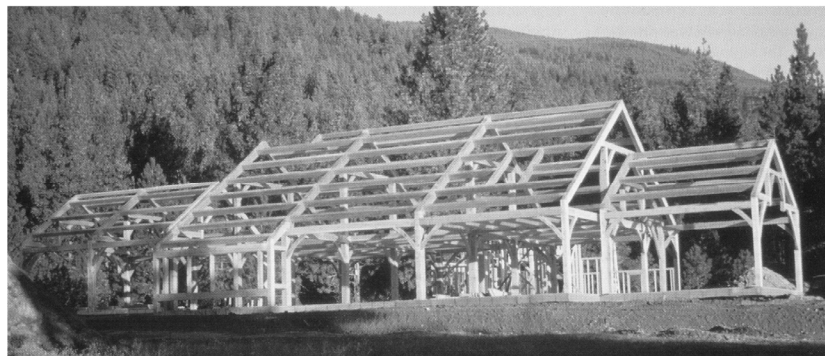
PRINCIPAL-RAFTER ROOF SYSTEMS

PRINCIPAL-RAFTER AND PRINCIPAL-PURLIN ROOF
Most of load is distributed to bents through principal purlin, leaving only a small load to be borne by eave plates. This system had English origins.



Timber Framing

timber frame development

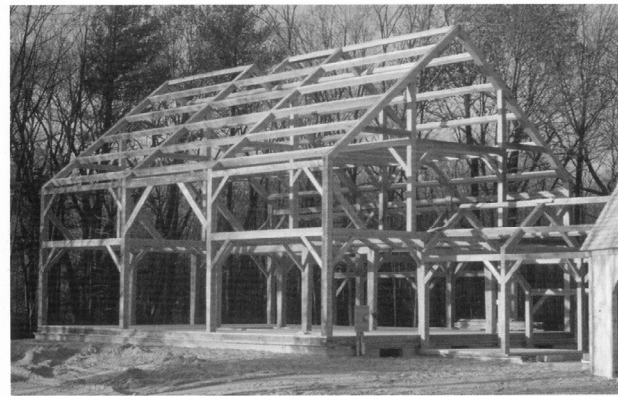


Timber Framing

timber frame development



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In the principal-rafter and common-purlin system, the frame is segmented into distinct bays, which reduces the need for excessively long timbers and the making of scarf joints. This frame has three 16-ft. bays.

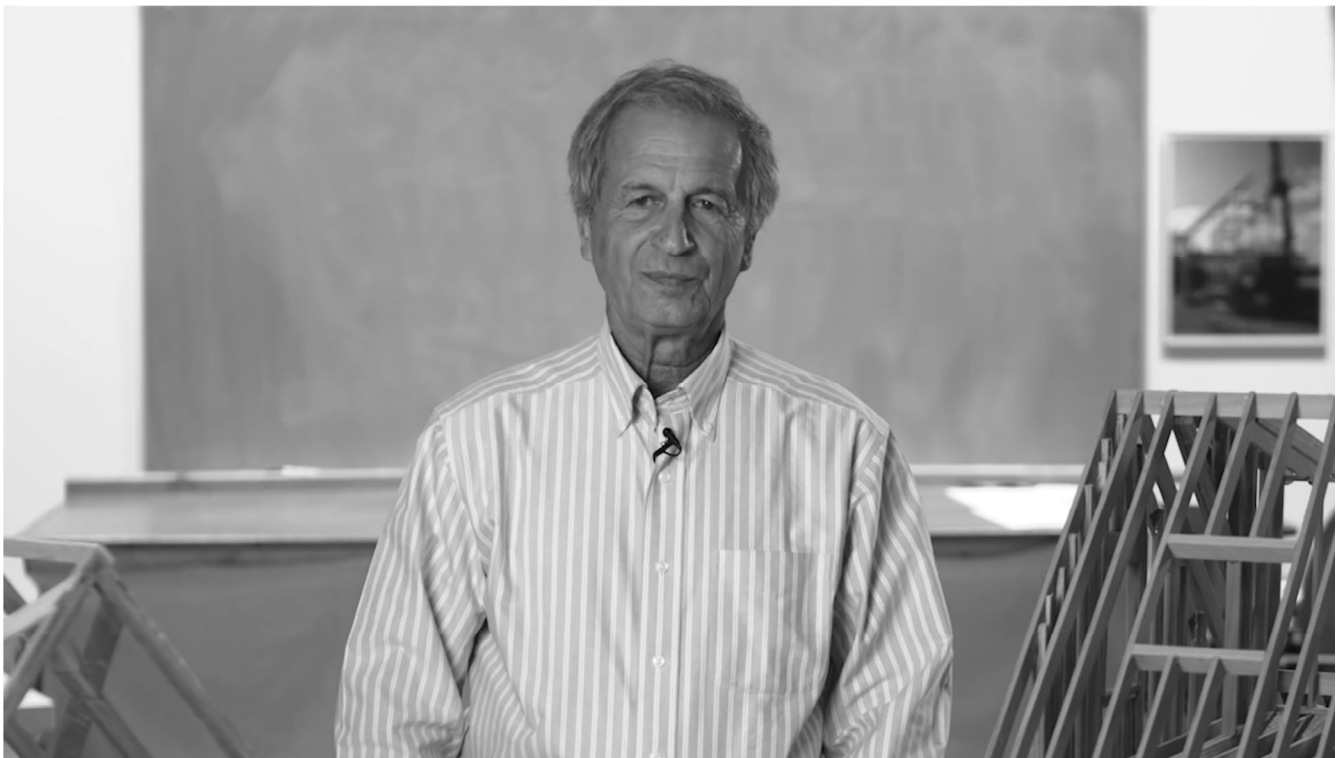


In this frame, of recycled fir, we were fortunate to have very long timbers available for the plates. Had that not been the case, scarf joints would have been required.

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Timber Framing timber frame vs. stick built



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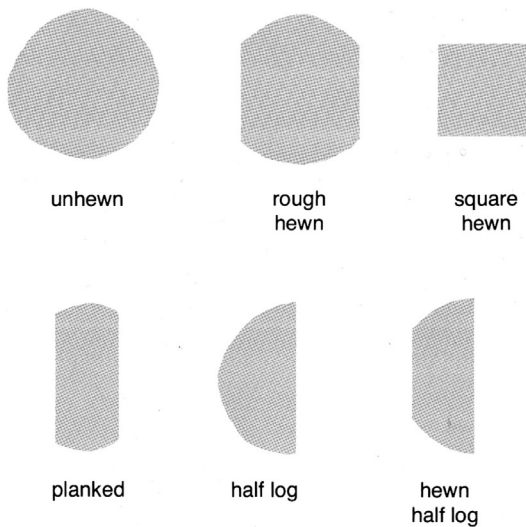
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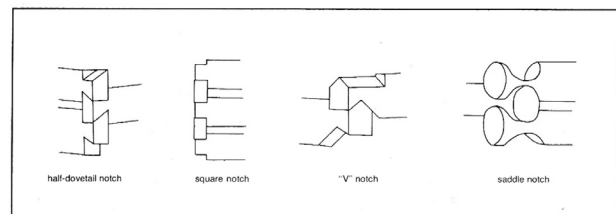


Timber Framing

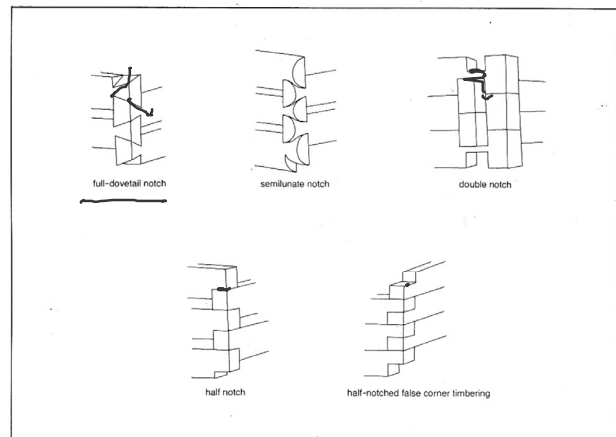
Log construction



50 Corner Notching



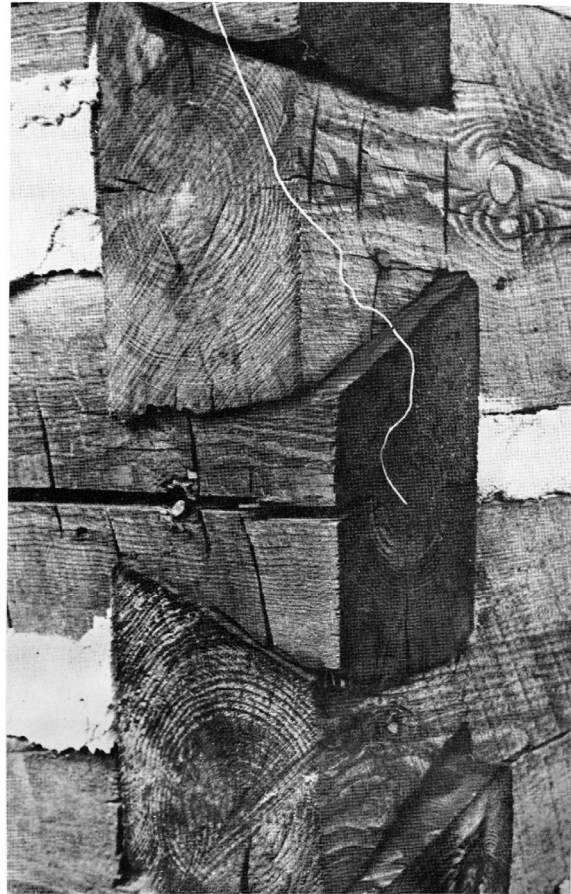
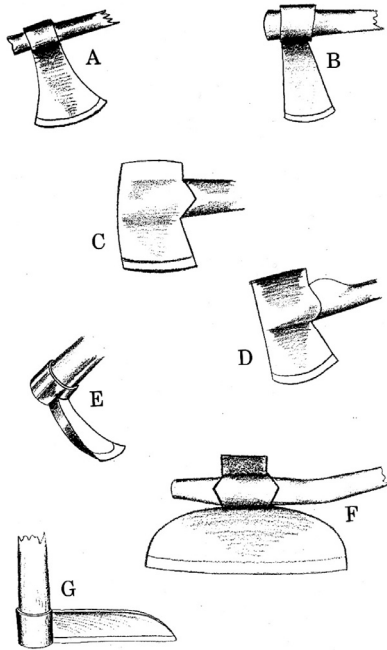
4-1. Most common types of log corner notching in Texas.



4-2. Minor notch types found in Texas.

Timber Framing

Log construction



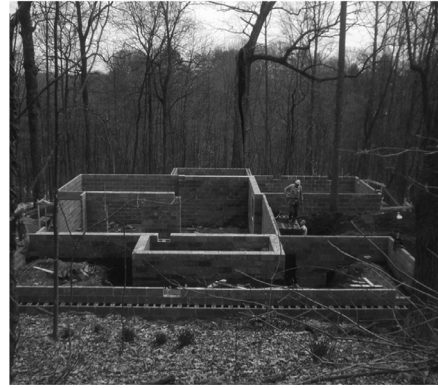
Timber Framing

von Buelow log home



Timber Framing

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Timber Framing

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Timber Framing

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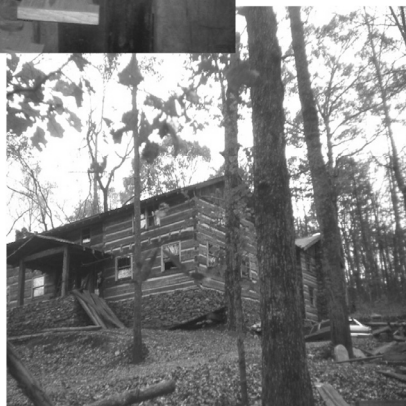
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Timber Framing

von Buelow log home



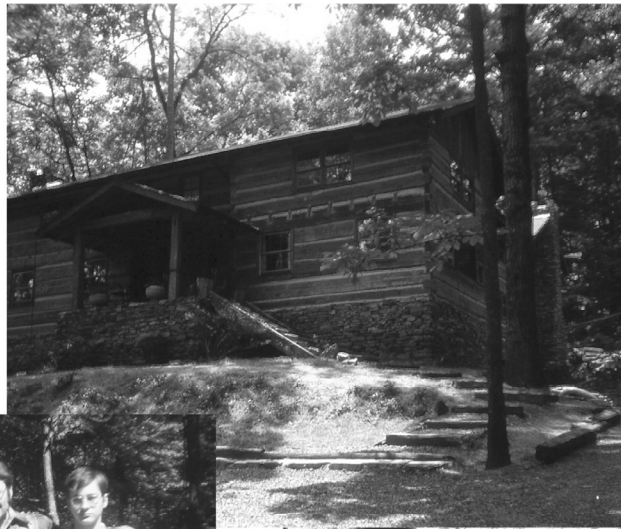
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Timber Framing

von Buelow log home



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