ARCH 1130

BUILDING TECHNOLOGY I

Professor Montgomery

FALL 2012

SUBJECT

WOOD

chapter 5

light frame construction_part I

DATE FALL 2012

PROFESSOR MONTGOMERY

WOOD

light frame construction

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this week

objective:

overview of the nature of light wood frame construction and the sequence and details of the assembly of a light wood frame structure

- transition from heavy timber
- inherent advantages
- platform vs balloon
- framing floors

HEAVY TIMBER CONSTRUCTION

structural frame

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HEAVY TIMBER CONSTRUCTION

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HEAVY TIMBER CONSTRUCTION

connections

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TRANSITION

to light wood frame construction

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WOOD

advantages of light wood construction

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BALLOON FRAME CONSTRUCTION

PLATFORM FRAME CONSTRUCTION

WOOD

types of light wood frame construction

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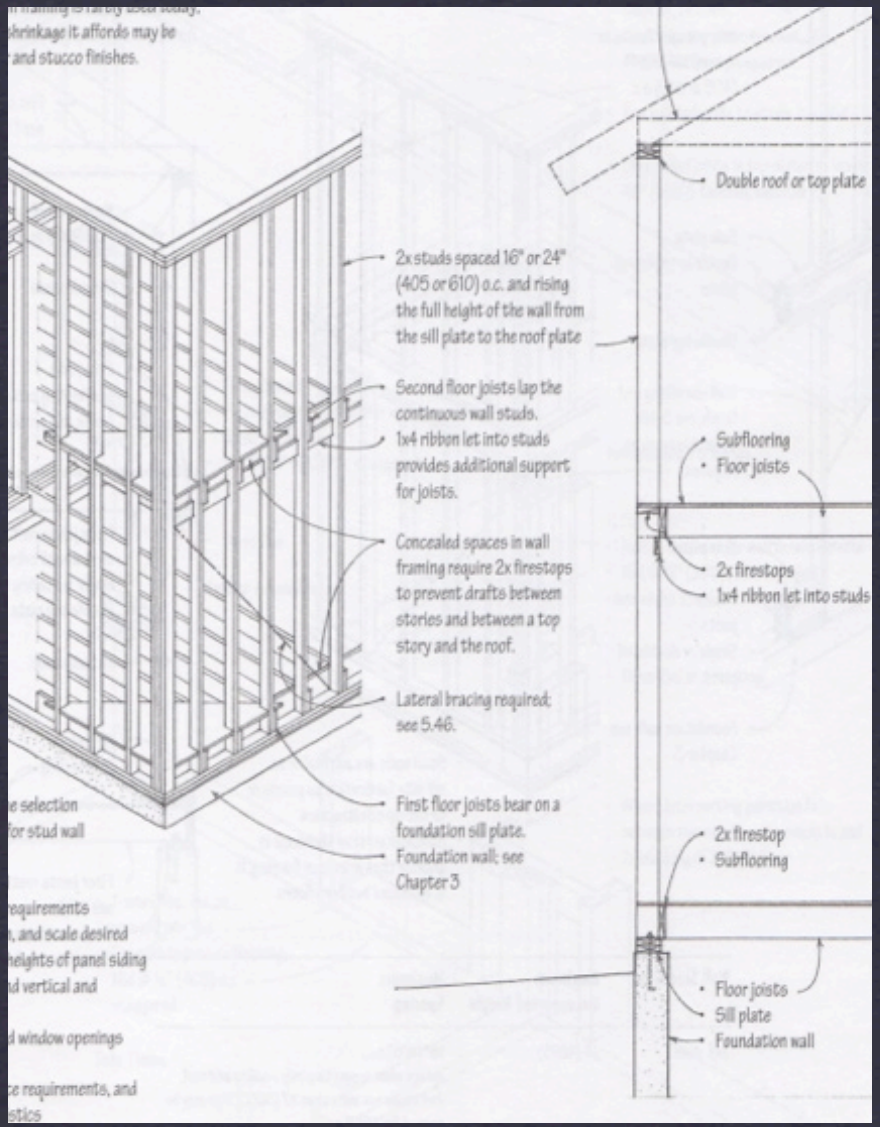
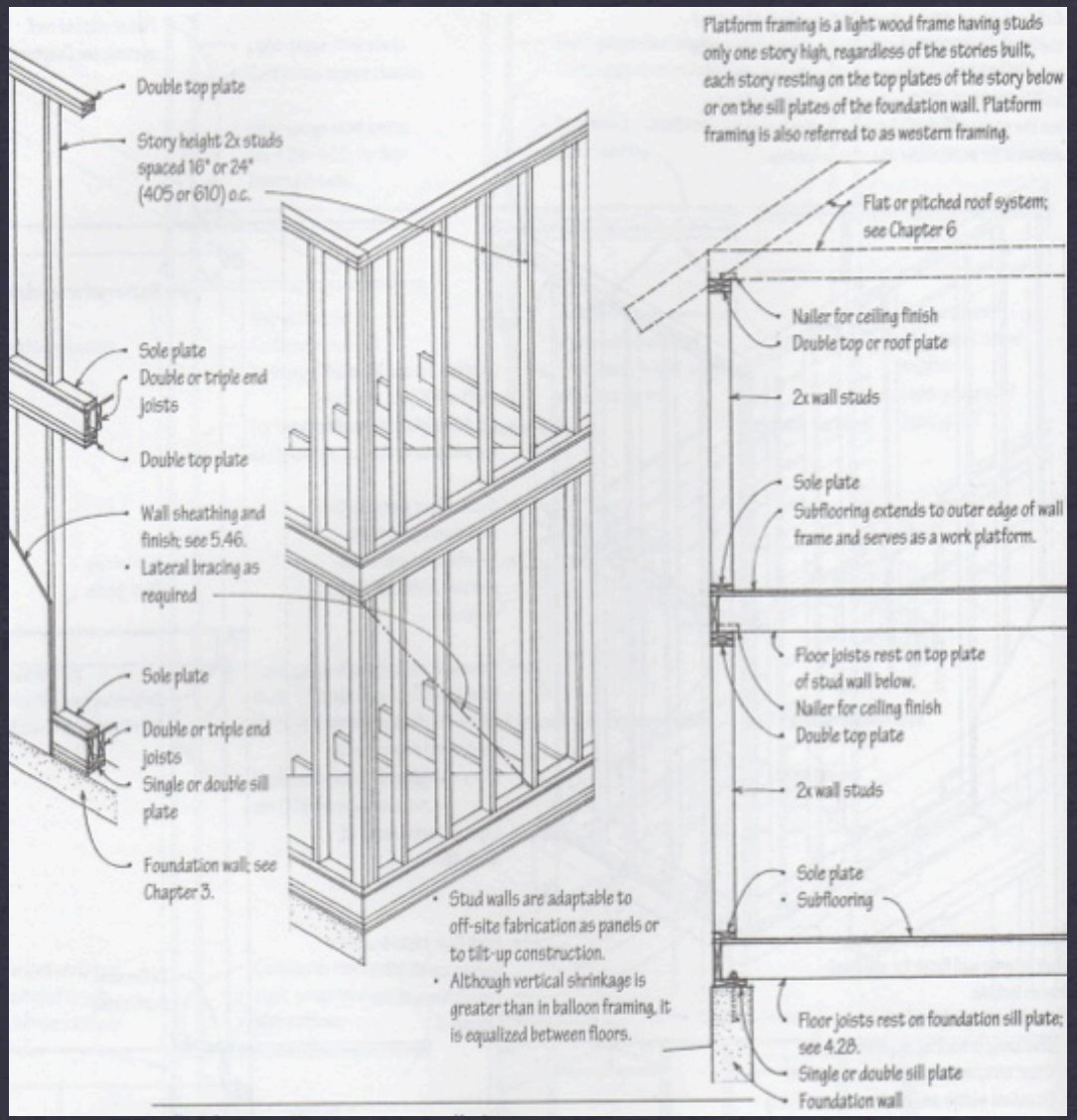


BALLOON FRAME



PLATFORM FRAME

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types of light wood frame construction

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✳PLATFORM FRAMING ADVANTAGES:

- ✳ SHORT STUD LENGTHS
- ✳FIRESTOPPING BETWEEN FLOORS
- ✳WORKING SURFACE DURING CONSTRUCTION

✳PLATFORM FRAMING DISADVANTAGES:

- ✳VERTICAL SHRINKAGE WITH MOISTURE LOSS

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platform frame construction

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LIGHT WOOD FRAME CONSTRUCTION

foundations

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LIGHT WOOD FRAME CONSTRUCTION

foundations

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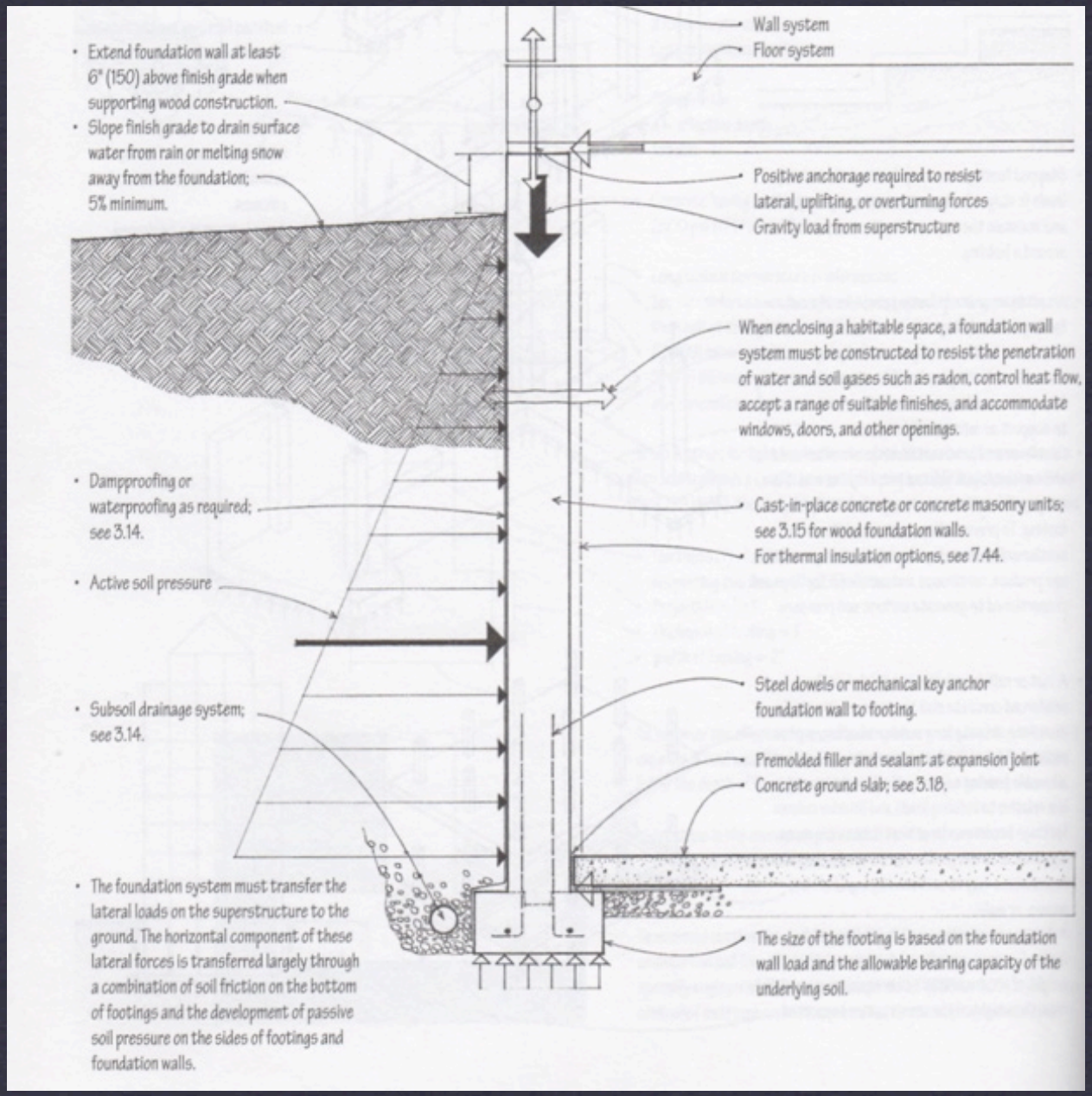

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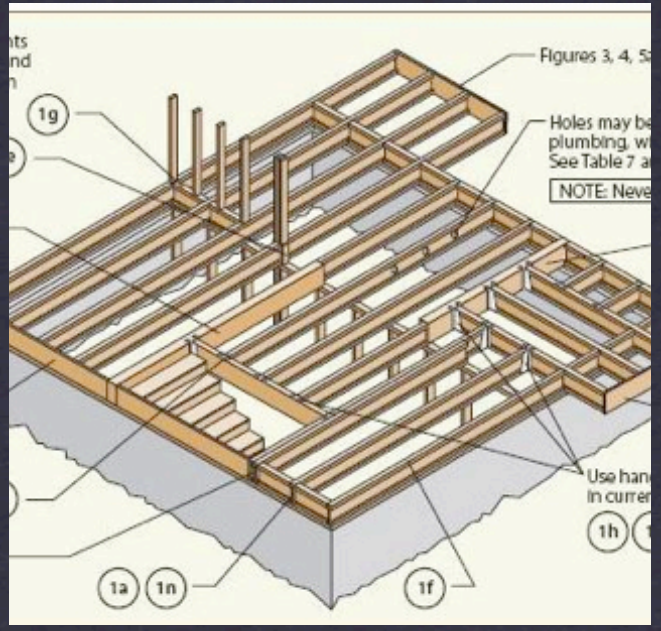

LIGHT WOOD FRAMING

building the frame _floors

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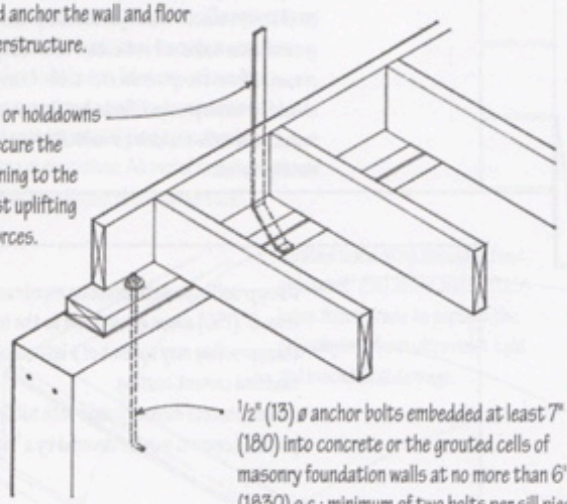
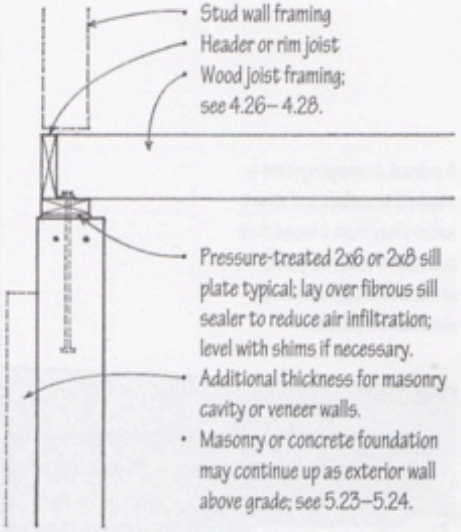
The top of a foundation wall must be prepared to receive, support, and anchor the wall and floor systems of the superstructure.

- Sill plate anchors or holddowns are required to secure the wall and floor framing to the foundation against uplifting wind or seismic forces.

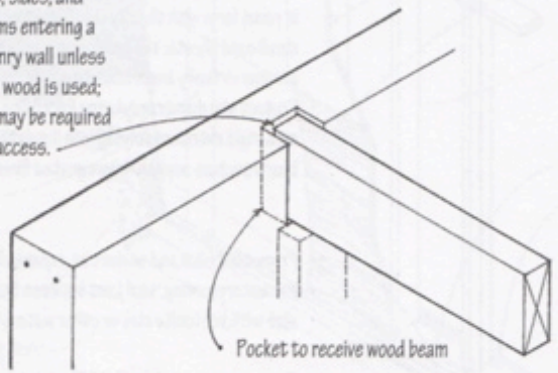


Wood Joists

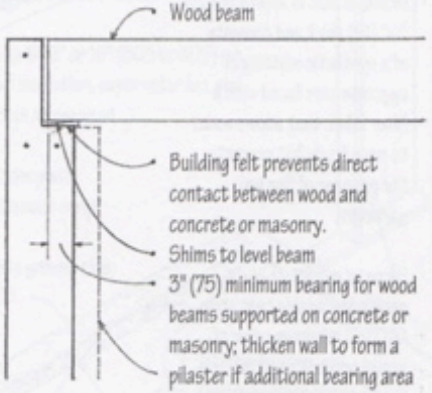
½" (13) ø anchor bolts embedded at least 7" (180) into concrete or the grouted cells of masonry foundation walls at no more than 6' (1830) o.c.; minimum of two bolts per sill piece w/ one within 12" (305) of each end; more stringent requirements exist for Seismic Zones 3 and 4.



- Provide ½" (13) minimum air space on the tops, sides, and ends of wood beams entering a concrete or masonry wall unless pressure-treated wood is used; additional space may be required for construction access.



Wood Beams



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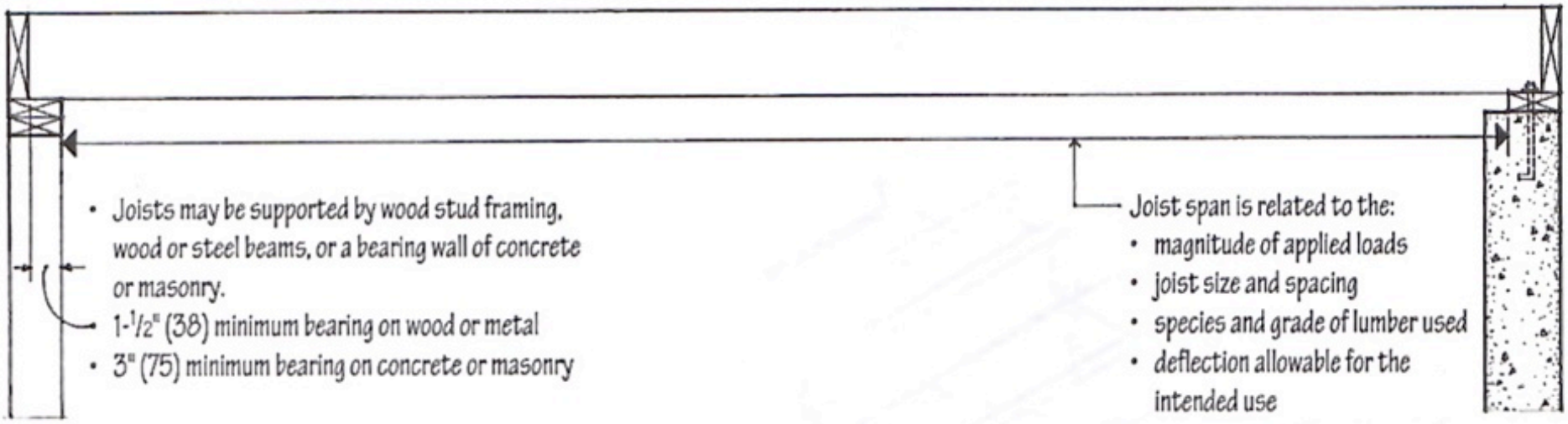
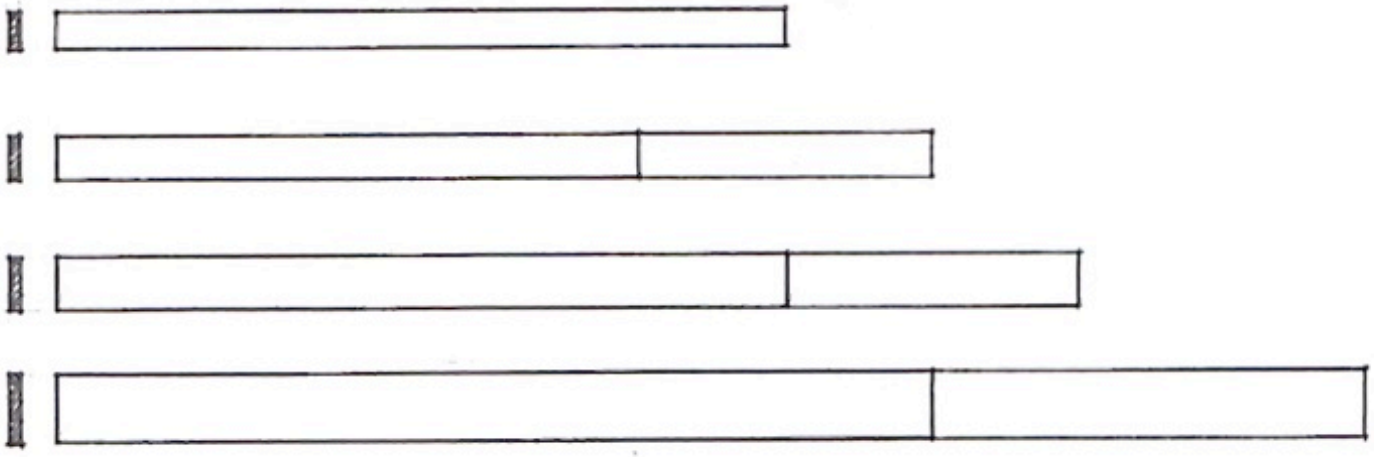


Span Ranges for Wood Joists



- Rule of thumb for estimating joist depth: span/16
- Joist deflection should not to exceed 1/360 th of span.

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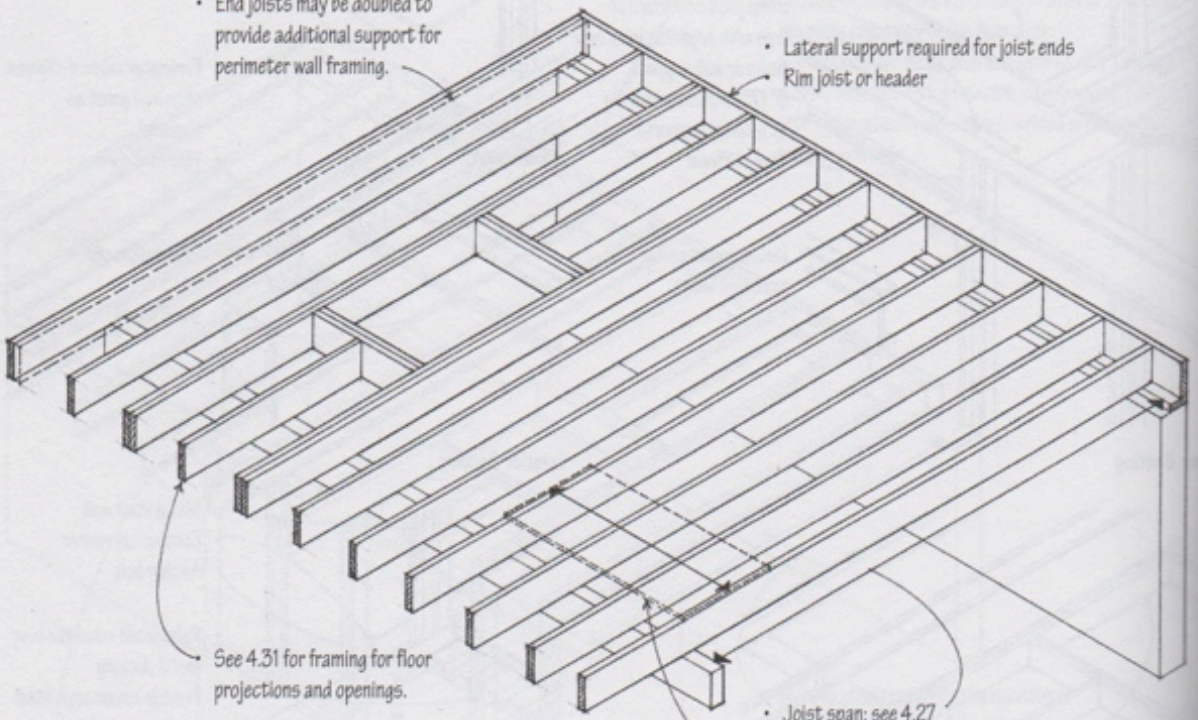
spanning capability of the subflooring.
Cavities can accommodate piping, wiring, and thermal insulation.
Ceiling may be applied directly to joists, or be suspended to lower ceiling area or conceal mechanical runs perpendicular to joists.

finish flooring and ceiling materials for its fire-resistance rating.
- The susceptibility of wood light framing to decay and insect infestation requires positive site drainage, adequate separation from the ground, appropriate use of pressure-treated lumber, and ventilation to control condensation in enclosed spaces.
- See 12.11–12.12 for discussion of wood as a construction material.

- End joists may be doubled to provide additional support for perimeter wall framing.

- Lateral support required for joist ends
- Rim joist or header



See 4.31 for framing for floor projections and openings.

- Joist span; see 4.27

Sheathing or subflooring ties and stabilizes the joists to prevent twisting and buckling; see 4.32.
- Finish flooring is laid over wood panel or plank subflooring; some finish flooring materials may require additional underlayment.

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LIGHT WOOD FRAMING

floor openings

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LIGHT WOOD FRAMING

framed walls

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wrap up

LIGHT WOOD FRAME CONSTRUCTION IS BY FAR THE MOST POPULAR FORM OF CONSTRUCTION IN THE US

- simple tools and techniques
- light members
- quickly assembled
- from a renewable source
- durable when protected
- only limits are the carpenter's imagination and ability