TIP SHEET - All About Home Framing and How to Find Problems

Here is a complete and thorough inspection guide for residential home framing. This guide is designed for homeowners, DIYers, and aspiring inspectors to identify structural issues, improper building practices, and age-related wear in a home's skeleton. This is NOT a home inspection and is intended to only provide preliminary information on a home's framing system. Inspectors or engineers should be used to provide more complete inspection and information on a home's framing systems.

A home's framing is its skeleton. If the framing is compromised, everything built around it—drywall, roofing, flooring, and exterior finishes—will eventually fail. Framing inspections require looking for **deflection (sagging/bowing), moisture damage, pest intrusion, and improper modifications** (usually done by previous homeowners or unqualified contractors). **ONLY ACCESSIBLE AREAS CAN BE CHECKED!**

General Inspection Tools Needed:

- Strong flashlight (1000+ lumens)
- Moisture meter
- Screwdriver or awl (for probing wood for rot)
- Plumb bob or 4-foot level
- Tape measure

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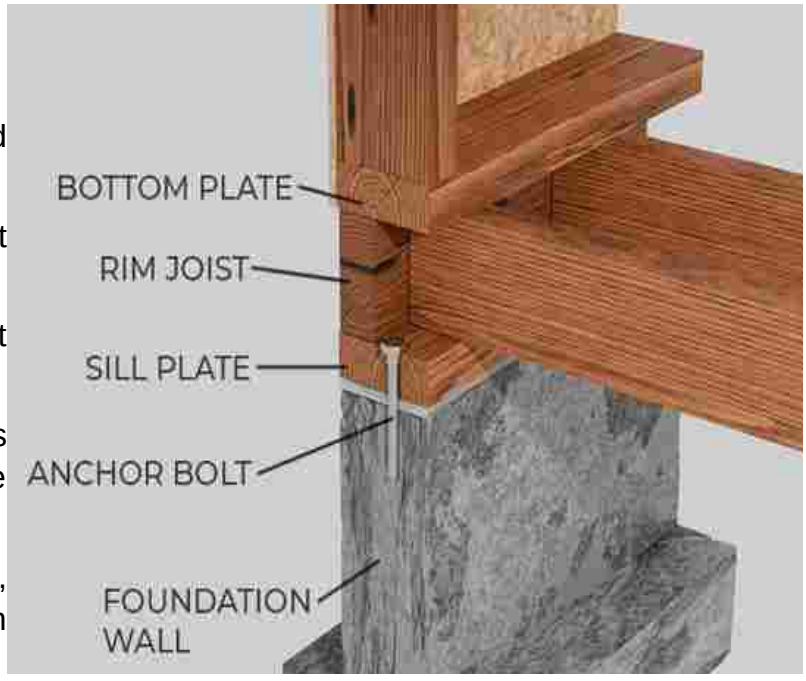
1. Foundation-Level Framing: Basements & Crawlspaces

The lowest level of framing carries the entire weight of the house. It is also the most susceptible to moisture and wood-destroying insects.

Components to Inspect

- **Sill Plate:** The bottom horizontal wood member resting directly on the foundation.
- **Rim Joist (Band Joist):** The perimeter joist that sits on the sill plate.
- **Floor Joists:** The parallel beams that support the subfloor.
- **Girders/Beams:** Main horizontal supports that carry the load of the joists to the columns.
- **Columns/Posts:** Vertical supports (wood, steel Lally columns, or masonry) resting on footings.



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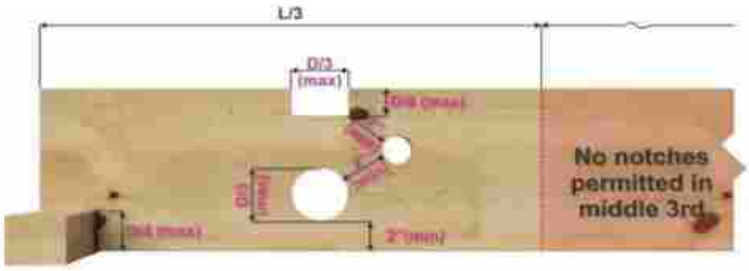
What to Look For (Common Problems)

- **Moisture & Rot:** Probe the sill plate and rim joist with an awl. If the wood is soft, crumbly, or spongy, rot is present. Look for water stains.
- **Pest Damage:** Look for termite mud tubes on the foundation walls leading to the sill plate, or small piles of "frass" (sawdust) which indicate carpenter ants or powder post beetles.

- **Improper Notching and Boring:** Plumbers and electricians often butcher joists to run pipes.
    - *Rule of thumb:* Holes should only be drilled in the middle third of the joist's depth. Notches should only be on the outer thirds of the joist's span. Never notch the middle third of a joist's span.



- **Sagging or Over-spanned Joists:** Look down the line of the joists. If they dip in the middle, they may be over-spanned (too small for the distance) or overloaded.
- **Improper Column Support:** Steel columns must be bolted to the beam above and secured to the floor below. Wooden posts must not sit directly on dirt (especially in crawlspaces).

Table 1: Basement vs. Crawlspace Framing Issues

Feature/Issue	Basement Framing	Crawlspace Framing	Inspection Focus
Moisture Source	Condensation, leaky foundation walls, poor exterior drainage.	Ground vapor, poor ventilation, standing water.	Look for vapor barriers (plastic sheeting) in crawlspaces. Look for efflorescence on basement walls.
Clearance	Usually high clearance.	Low clearance; wood is dangerously close to soil.	Crawlspace wood should be at least 18" above dirt (joists) and 12" (beams).
Sill Plate Fastening	Anchor bolts clearly visible holding sill to concrete.	Often missing anchor bolts in older homes or obscured by tight spaces.	Verify anchor bolts are present every 4-6 feet and within 12" of corners.
Insulation Placement	Often placed against foundation walls or between joists.	Usually between floor joists with paper facing *up* (toward living space).	Ensure insulation isn't hiding rot or termite damage at the rim joist.

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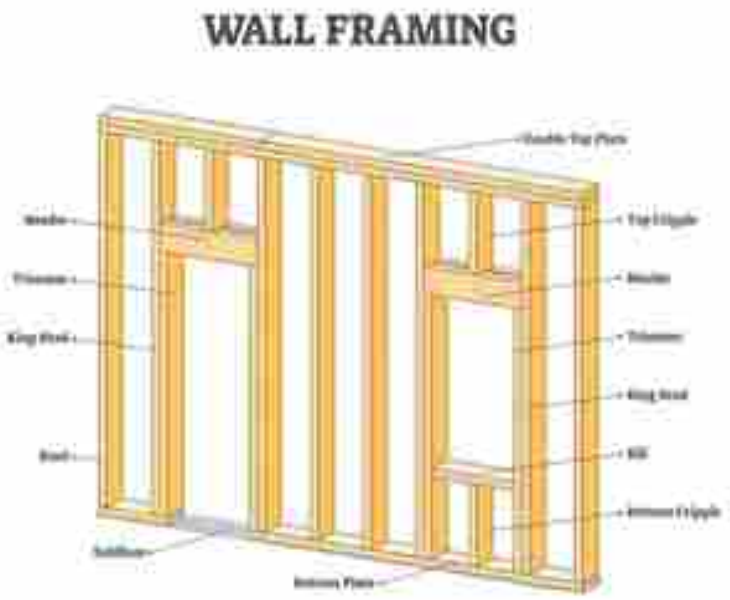
2. Living Area Framing: Walls, Floors, and Ceilings

Framing in the living areas is mostly hidden behind drywall, but clues to framing failure will manifest in the finishes.

Components to Inspect

- **Studs:** Vertical framing members (usually 2x4 or 2x6 spaced 16" or 24" on center).
- **Headers:** Heavy beams over doors and windows that carry the load above the opening.
- **Top/Bottom Plates:** Horizontal framing that caps the studs.
- **Subfloor:** Plywood or OSB laid over the floor joists.



What to Look For (Common Problems)

- **Sagging Headers:** If doors are sticking, won't latch, or have "ghosted" (swing open or closed on their own), or if there are diagonal drywall cracks radiating from the top corners of door/window frames, the header is likely undersized or sagging.
- **Bowed Walls:** Place a 4-foot level against walls. Noticeable bowing can indicate overloaded studs, warped lumber, or a settling foundation.
- **Uneven/Bouncy Floors:** Walk heavily across the floor. If the floor bounces excessively, the joists below lack bridging/blocking or are over-spanned. Squeaks usually indicate loose subfloor nails rubbing against joists.
- **Missing Fire-blocking:** In balloon-framed homes (built before 1930), wall cavities run continuously from the basement to the attic. This creates a chimney effect during a fire. Look in the basement where the walls meet the floor; if you can look straight up into the wall cavity, fireblocking is missing.

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Table 2: Framing Types & Associated Risks

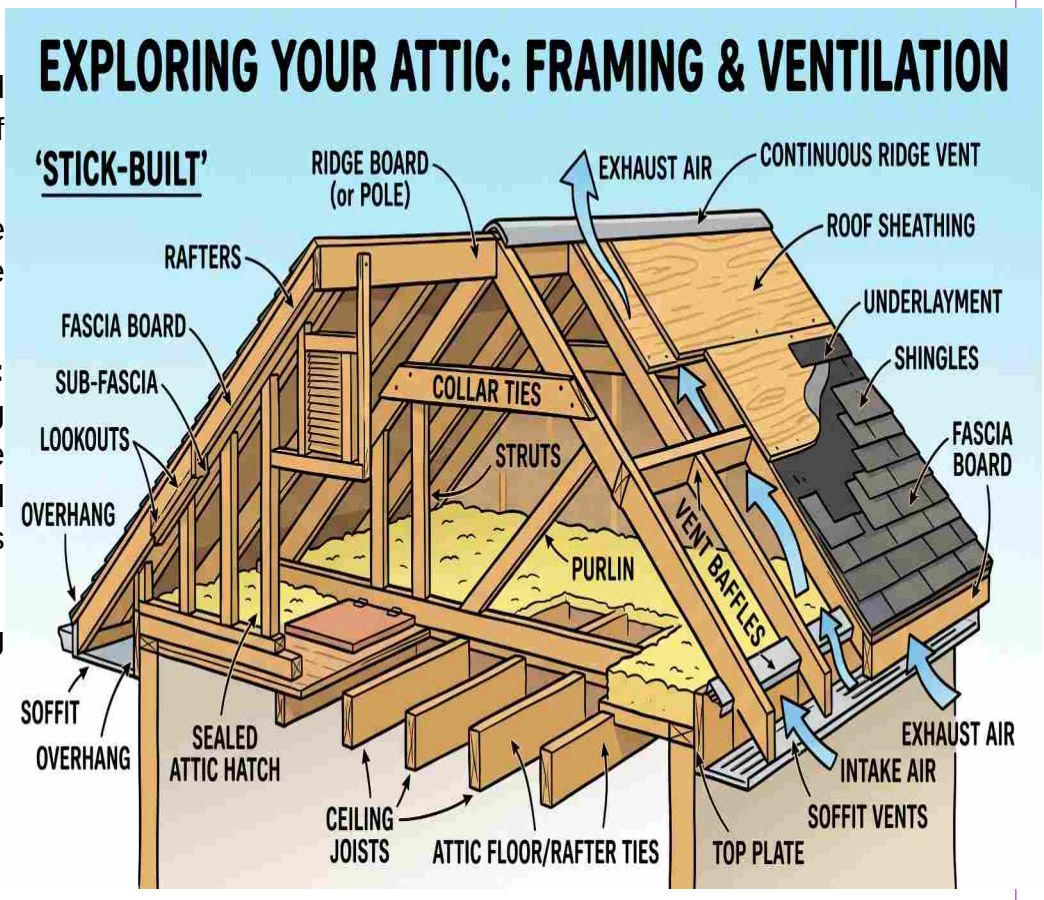
Framing Style	Era Common	Description	Primary Inspection Risks / Issues
Balloon Framing	1880s - 1930s	Continuous wall studs running from foundation to the roof. Floor joists hang on ledger boards.	**Extreme Fire Hazard.** Fire easily travels from basement to attic. Prone to exterior wall bulging over time.
Platform Framing	1930s - Present	Each floor is framed as a separate "platform." Walls are built on top of the subfloor.	Safer for fire. Issues are usually localized to improper modifications, water leaks from plumbing, or poor fastening.
Advanced/ Optimum Value	2000s - Present	Uses 2x6 studs at 24" on center, aligns joists/studs/rafters to reduce lumber waste and maximize insulation.	Less structural redundancy. Requires precise load path alignment; if one member fails or is cut, it impacts the structure more heavily.

3. Attic and Roof Framing

The roof framing must resist gravity, wind, and snow loads while transferring the weight down to the exterior walls.

Components to Inspect

- **Rafters/Trusses:** The angled members that create the roof shape.
- **Ridge Board/Beam:** The peak horizontal board where rafters meet.
- **Collar Ties & Rafter Ties:** Horizontal boards connecting opposite rafters to prevent the roof from flattening and pushing the exterior walls outward.
- **Sheathing:** The roof decking (plywood, OSB, or plank).



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What to Look For (Common Problems)

- **Roof Sag (Deflection):** Look at the roofline from the exterior. A wavy or sagging roof or ridge line indicates an undersized ridge beam or missing collar/rafter ties or other framing issues.
- **Altered Trusses: NEVER cut a roof truss.** Trusses are engineered systems. If a homeowner has cut truss webs to make room for attic storage, the structural integrity of the roof is severely compromised.
- **Water Stains and Delamination:** Inspect the sheathing from inside the attic. Dark stains around chimney penetrations, vent pipes, or valleys indicate roof leaks. If plywood sheathing is separating (delaminating), it has been subjected to chronic moisture.
- **Inadequate Fastening:** Ensure rafters are secured to the top plate of the walls, ideally with metal hurricane ties.
- **Sheathing Pops:** Check that the roof sheathing is flat and not “popped up” and uneven.

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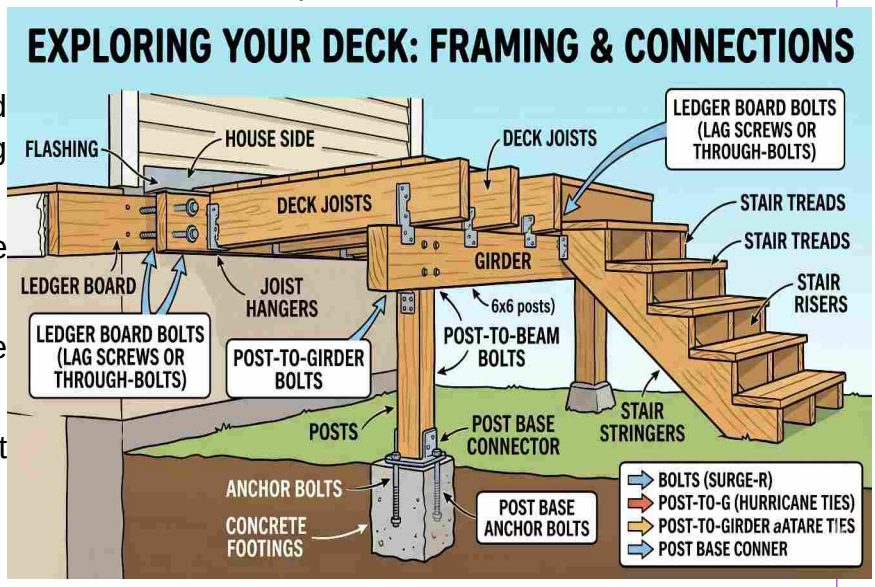
4. Exterior Framing: Entrances, Porches, and Decks

Deck and exterior framing failures are responsible for some of the most catastrophic residential collapses due to the combined effects of heavy loads, exposure to weather, and poor DIY construction.

Components to Inspect

- **Ledger Board:** The wood board attached directly to the house framing, supporting one side of the deck.
- **Deck Joists & Hangers:** Support for the decking boards.
- **Posts and Footings:** Support for the beam/girder.
- **Stair Stringers:** The notched boards that support stair treads.



What to Look For (Common Problems)

- **Improper Ledger Attachment (CRITICAL):** The ledger board *must* be bolted or lag-screwed to the house's band joist. It must **never** be attached with standard nails, and it must **never** be attached into brick or stone veneer.
- **Missing Flashing:** There must be metal or vinyl flashing over the ledger board. Without it, water gets behind the ledger, rotting the home’s main structural band joist.

- **Incorrect Joist Hangers:** Look at the metal brackets holding the joists. Are all nail holes filled? Are they filled with proper, thick galvanized joist hanger nails (not thin roofing nails or deck screws)? Deck screws are brittle and have low shear strength; they will snap under weight.
- **Wood-to-Earth Contact:** Deck posts should sit on metal brackets atop concrete footings that extend below the frost line. Wooden posts buried directly in the dirt will rot rapidly.
- **Lack of Lateral Bracing:** Tall decks (over 4 feet) need diagonal bracing between the posts and beams to prevent the deck from swaying and collapsing under shifting weight (like during a party).

Table 3: Evaluating Exterior Attachments

Attachment Area	Proper Installation Standard	Red Flags (Defects)	Potential Consequence
Ledger Board	1/2" Lag screws or through-bolts staggered every 16"; proper Z-flashing installed.	Attached with nails; bolted through siding/stucco; no flashing; attached to cantilevered house overhang.	Complete deck collapse; severe rot to the house's main structure.
Post to Footing	Post sits on a metal standoff bracket anchored into a poured concrete pier.	Post buried in soil; post resting directly on a concrete block or patio paver.	Post rot; settling; shifting of the deck structure.
Joist Hangers	All holes filled with heavy-gauge galvanized 10d or 16d joist hanger nails.	Missing nails; use of drywall/deck screws; undersized hangers; rust.	Joists slipping out of hangers, causing localized deck failure.
Guardrails	Posts bolted directly to the deck substructure with tension ties. Min. 36" height.	Posts only notched and screwed; wobbly when pushed; gaps between balusters larger than 4 inches.	Guardrail failure resulting in falls and severe injury.

Summary Checklist for Inspection

1. **Check the bones first:** Go to the basement/crawlspace. Look for rot, termites, and unauthorized plumber/electrician cuts in the floor joists.
2. **Follow the load path:** Ensure columns line up with beams, and beams properly support joists.
3. **Read the living space:** Plumb, level, and square. Sagging floors, diagonal wall cracks, and sticking doors are the house telling you the framing is moving.
4. **Examine the attic:** Look for sagging ridge lines, uncut engineered trusses, and water-damaged sheathing.
5. **Scrutinize the deck:** Verify ledger board bolting and flashing, check for correct joist hanger nails, and ensure posts are clear of the dirt.

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THIS TIP SHEET IS NOT INTENDED TO REPLACE OR TEACH YOU HOW TO PERFORM PROFESSIONAL FRAMING EVALUATIONS.

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