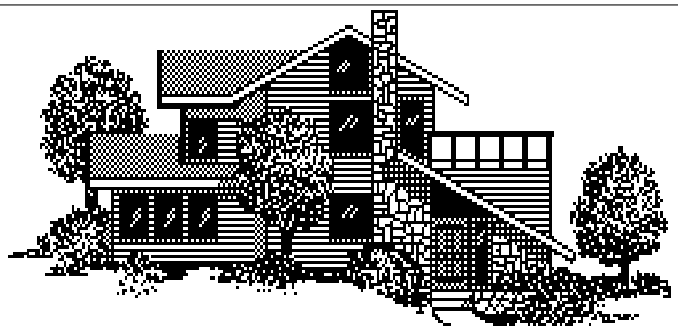
the Inspection Reporter



Ronald D. Scott, P.E.

It would seem that an independent inspection would not be necessary for a newly constructed home. After all, the home is "brand new", and the builder provides you with a warranty ------ the home should be almost perfect -------- shouldn't it? In a perfect world, that might happen, but in the real world we live in, the number of findings typically identified in a new construction evaluation easily justifies the cost of the inspection. Why isn't a new home almost perfect? The causes are many, but often include: a high level of new construction activity; unqualified sub-contractors and/or supervisors; building plans without adequate detail and specifications; and/or, the pressure of meeting construction deadlines.

New Construction Inspections

Are They Really Necessary?

The building "code" that is currently used as the standard for residential construction is the 2003 *IRC (International Residential Code) for One and Two Family Dwellings*. The primary purpose of the building code is to protect the health and safety of the occupants of a home. Copies of the International Residential Code can be obtained online at: www.iccsafe.org or, by calling the International Code Council (ICC) at (205) 591-1853. A common misconception regarding building codes is that construction outside of a local jurisdiction is not covered by any codes ----- this concept is often cited by builders and contractors who do not have an adequate understanding of residential construction codes. In the absence of local or municipal codes, the current IRC codes apply to all new construction in the United States, no mater how remote the building site is.

Depending on the builder and location of the site, residential construction is often inspected by city or municipal inspectors, warranty inspectors (if home is to be covered by an insurance-type warranty plan), energy efficiency inspectors (certification plans promoted by utility companies), and some builder's even conduct their own Quality Control inspections. Of course, the builder's supervisor is present throughout the construction process; however, in booming building markets, some of the on-site construction supervisors have minimal construction and/or managerial experience.

History has shown us in past real estate "booms" that new builders enter the market, further reducing the experienced construction labor pool, resulting in an increase in substandard new construction. **Don't make the mistake of thinking that it is not worth it to obtain professional advice, to insure that your commitment to this major investment is a sound decision.**

If an inspection is conducted, it is recommended that all repairs, corrections and improvements be completed prior to closing on the sale of the home.

Foundations

This inspector utilizes the following procedures for inspecting new foundations.

- The visible portions of the foundation perimeter (and surface, where possible) are inspected for cracks and/or construction deformities; however, visible foundation defects are normally rare. Typical conditions observed are minor "hairline" surface cracks, and diagonal cracks at the foundation corners. Cracks at the perimeter grade beams are **not** common, and often require further investigation and/or testing.
- A foundation surface elevation survey is conducted; the elevation difference measured across the surface area of the foundation should be less than 1.5" on a normal sized foundation (typical elevation variance range attributable to foundation construction level variances). However, this inspector has identified three new foundations with surface elevation variances exceeding 3"; these homes may be very difficult to resell in the future! The surface elevation survey information is valuable, in that it establishes a "benchmark" for the future, should any abnormal foundation movement conditions occur.
- For post-tension foundations, tendon (cable) ends and anchors should not be exposed at the foundation perimeter; all anchor pockets should be properly grouted/sealed, and anchor nails trimmed flush with the foundation surface, to comply with current PTI (Post Tension Institute) specifications. Any areas of "honeycombing" at the foundation perimeter (grade beam) surfaces should be properly sealed with grout.

A limited degree of post-construction foundation movement (and associated structural movement) is typical, as a result of soil compaction and/or soil moisture variations. Proper site drainage and uniform moisture around the foundation perimeter are extremely important conditions for foundation stability. Consistent, uniform perimeter surface watering will assist in minimizing typical seasonal/cyclic foundation movement, and is recommended during extended dry periods (automatic lawn sprinkler systems are recommended). For information regarding Houston soil conditions and maintenance guidelines for foundation stability, see article "Recommended Homeowner Foundation Maintenance Program for Residential Projects in the Houston Area", at the following website: www.geotecheng.com (click "Guidelines" under "Publications" at sidebar).

Note: An inspection does not constitute a warranty and/or guarantee as to future life and/or performance of the foundation. The foundation should be covered by a 10-year transferable warranty (currently provided by most builders).

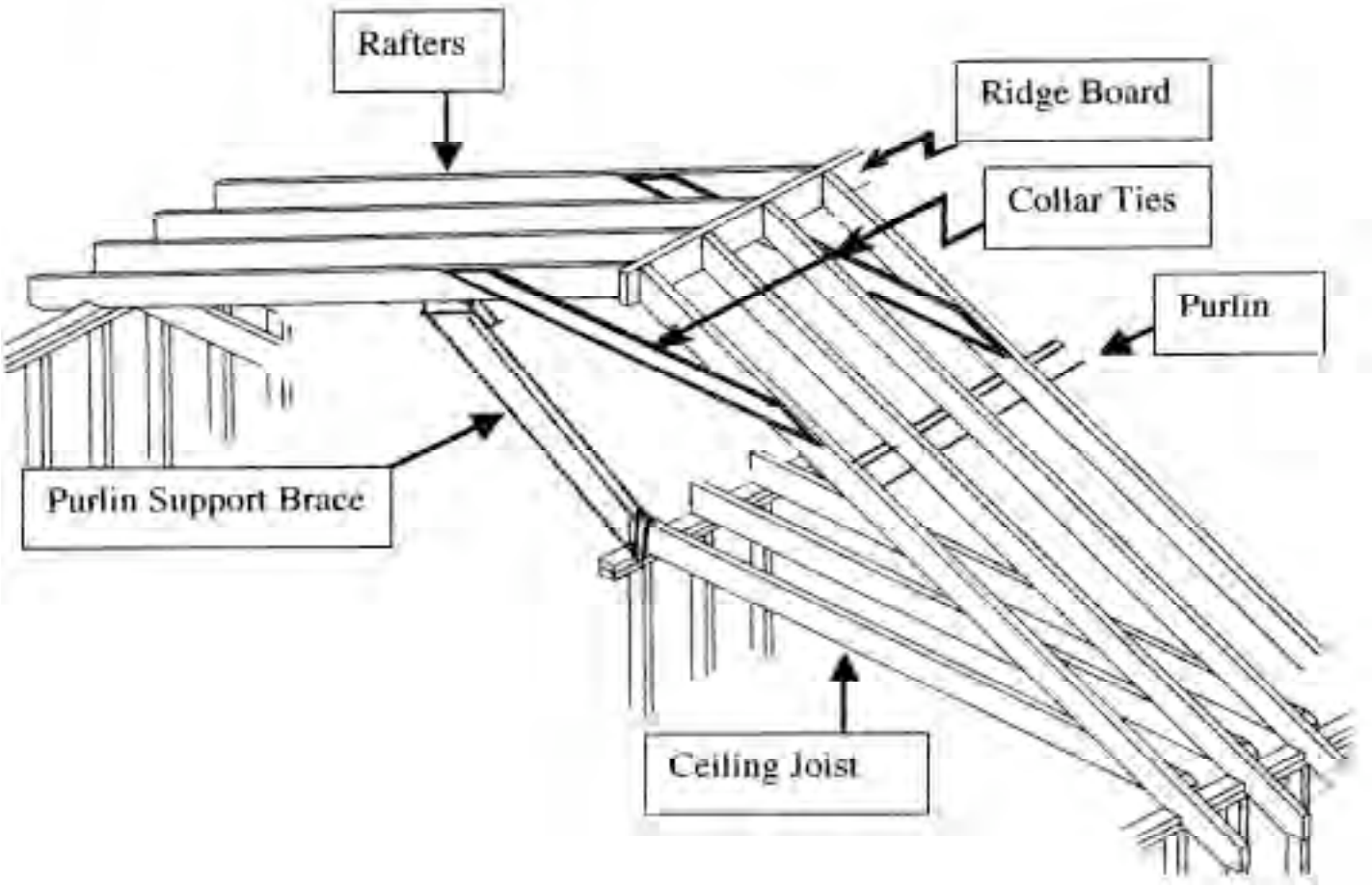
Roof Framing

The building codes specify the minimum framing requirements for roof substructures, which results in the capacity to support normal roof load conditions ("dead" loads comprised of framing, sheathing and covering), and a reasonable degree of infrequent/varying surface load conditions ("live" loads, such as ice or roof contractors). Some examples of new construction framing deficiencies are:

- The most common condition is excessive rafter spans, often resulting in a "sagging" roof surface condition (deflection), which may be visible from a ground-level view; this condition often requires the addition of purlin support bracing.
- Ridgeboard and/or hip or valley rafters that are inadequate in design (adjoining rafters exceeding depth of ridgeboard or hip/valley rafters).
- Purlins (typically 2"x 6" framing) that are inadequate in design; purlins are required to be at least the dimension of the rafters (2"x 8" rafters require the use of 2"x 8" purlins).
- Non-uniform rafter spacing, resulting in rafters not being directly opposed by an opposite pitch rafter (at the ridgeboard).
- Unsupported spliced rafters; spliced rafters should be supported with bracing in the area of the "overlap" (spliced area).
- Rafters supported by ceiling framing, which is typically inadequate in design to provide minimum roof framing design load requirements for the Houston area (to support 10 pounds per square foot of "dead" load, and 20 pounds per square foot of "live" load).

See drawing on following page for a description of common roof framing members.

Roof Framing; continued



Appliances and Mechanical Components

- Kitchen Rangetop Vents: The vent piping is required to be galvanized type metal vent piping, with smooth interior surfaces (corrugated, flexible types of piping are not approved).
- Overhead Garage Door Operators: Wall control switches are required to be a minimum of 60" above floor level for child safety, and photo-electric sensors for the safety retraction function are required to be no more than 6" above the garage floor level.
- Air Conditioning Systems: When multiple units are installed in an attic area, each primary condensate drain from an evaporator is required to be piped separately to the drain.
- Air Conditioning Ducts: Mastic seals are required at duct/plenum joints, and at all equipment joints where air leaks could occur. Five-ton A/C system air returns are frequently undersized; a 20"x30" (600 square inches) return opening is required for minimum return air flow, and it is preferable to have at least two returns in the home for optimum system air flow in the home.
- Typical electrical deficiencies observed at main service electrical panels: 1) White wiring in use as "hot" wiring; all "hot" wiring must be identified with red or black. 2) Panel coverplate screws in contact with "hot" wiring; an electrical hazard. 3) Air conditioner condenser circuit breakers oversized, based on the unit specifications. 4) Lack of bonding between the ground buss and the breaker box.
- Bathtubs: 1) Service access is required for the piping and valves to plumbing fixtures. 2) Drain piping penetrations through foundations are required to be sealed (around piping).
- Exterior Hose-bib Faucets: Are required to be fitted with approved anti-backflow devices.
- Gas Piping: 1) Piping to furnaces and water heaters is required to include a "drip leg" fitting ("sediment trap"). 2) The flexible-type gas piping normally used at furnaces is not approved for use inside the furnace housing (rigid metal piping is required inside the furnace housing).

Stairways and Handrails

Stairways, handrails and guardrails are regulated not only by the IRC building codes, but also by the American Disability Act provisions (1992), which defines various "safety hazard conditions". Some examples of the most common construction requirements:

- The separation/clearance between handrail or guardrail balusters must not exceed 4".
- Stairway handrails are required to be between 34-38" in height, and guardrails are required to be a minimum of 36" in height.
- Continuous handrails are required for the full length of a stairway, and must conform with specific "graspability" and wall clearance requirements (1-1/2"). Handrails are required to have a "return" (trim piece) at the ends of the handrail.
- Handrails, guardrails and balusters are required to meet minimum standards for human impact load conditions (able to withstand a significant horizontal force without damage).
- At "winder" type stairways, stairway treads (step surfaces) are required to be a minimum of 6" in width at the narrowest point. The maximum riser (step) height is 7-3/4", and the minimum tread depth (width) is 10". The maximum height variation for steps is 3/8", within any flight of stairs.

The Bottom Lines

Testing and/or assessment for environmental hazards, allergens and/or toxic/hazardous materials (including, but not limited to: air quality, radon, asbestos, lead, chemical, mold, mildew, and other biological contaminants) is beyond the scope of a home inspection. For information regarding mold and mildew issues, see the EPA website at: www.epa.gov/iaq/molds/index.html.

The Texas Real Estate Commission regulates inspectors through licensing and a comprehensive "Standards of Practice". The rules and regulations may be obtained from the Texas Real Estate Commission (Austin, Texas), at: (512) 465-5915; or, online at: www.trec.state.tx.us.

Blueprints/Building Plans/Appliance & Equipment Information and Warranties: It is recommended that all manufacturer's information and warranties be obtained for all appliances and equipment in the home.

While some builders may restrict the release of their architectural drawings (blueprints), it is recommended that every effort be made to obtain a full set of "as-built" plans.

A (PDF) version of this newsletter is available by E-mailing a request to rdspe5@AOL.com . Other newsletters, and a sample of a typical new construction inspection is posted on my website, at: www.ronaldscottpe.com

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