

Foundation Inspections

Instructor: Isaac "Zack" Lilienfeld, PE
NJ Home Inspector Lic. #24GI00050500
NJ Professional Engineer Lic. # 24GE003494000

Session Description:

This 2-hour instructional session is a primer on the types of residential foundations typically encountered by home inspectors, how to properly inspect them, and reporting on foundation defects.

Session Goal:

"To increase the knowledge and the confidence of the participant with regard to residential foundations, improve the quality of inspection reports, thus providing superior value to the home inspector's client".

Learning Objectives:

Upon completion of the session, participants will:

1. Understand the types of foundations and installations commonly found in residential construction.
2. Become familiar with foundation terminology.
3. Know what to look for when inspecting foundations.
4. Learn safe practices when inspecting foundations.
5. Be able to know the difference between cosmetic issues, structural issues and structural defects; and whether an issue rises to the level of a material defect.
6. Increase their level of confidence in evaluating foundation issues and defects.
7. Know when it is appropriate to refer out to a structural engineer or foundation contractor.
8. Be able to write coherent, meaningful and descriptive inspection report narratives on foundation issues

Session Outline:

- 1. Opening Remarks (5 minutes)**
 - a. Introduction
 - b. Setting the stage
 - c. Goals and objectives of session
- 2. Common Foundation Materials (5 minutes)**
 - a. Concrete
 - b. Concrete Block
 - c. Brick
 - d. Stone

- e. Wood (pilings)
- 3. Types of Foundations and Foundation Walls (20 minutes)**
 - a. Slab
 - b. Pier and beam
 - c. Continuous (concrete, brick, structural panel)
- 4. Role of the home inspector (10 minutes)**
 - a. Assess conditions and determine safe access to inspect
 - b. Identify the type of foundation system(s)
 - c. Observe conditions
 - d. State what was visible to inspect and what was obstructed or inaccessible
 - e. Report on structurally significant and material defects
 - f. Know when to refer out to other professionals
- 5. Be Prepared: Tools and Equipment (5 minutes)**
 - a. Flashlight
 - b. Crawlspace suit
 - c. Probe
 - d. Laser distance meter
- 6. Defect identification (30 minutes)**
 - a. Foundation walls
 - i. Cracks - identifying and assessing, "reading" cracks
 - ii. Settlement issues
 - iii. Deflection/bowing
 - b. Framing - conventional and engineered
 - i. End bearing issues
 - ii. Undersized/improper framing
 - iii. Types of framing issues found - compression, deflection, rot and insect damage
- 7. Understanding the causes of common foundation problems (15 minutes)**
- 8. Reporting on defects (20 minutes)**
 - a. What to report when the foundation is inaccessible or hidden
 - b. Describing the condition coherently descriptively
 - c. Noting the extent and location of the defect(s)
 - d. What and how to report when you suspect hidden damage
 - e. Reporting on reasons for damage
 - i. Damage due to saturated soils
 - ii. Insect damage and rot
 - iii. Use of non-standard or inferior materials
 - iv. Homeowner repairs
 - f. Educating vs. alarming the reader of the report - it's how you say it
- 9. Photos and discussion of foundation issues and defects (10 minutes)**

Evaluation: Class participation/sign-in and sign-out

Timing: 2 Hours

Materials: PowerPoint presentation, handouts

BIOGRAPHY OF ISAAC "ZACK" LILIENFELD, P.E.

Zack Lilienfeld is a 1978 graduate of Lehigh University, Bethlehem, PA, with bachelors degrees in both Mechanical Engineering and Civil Engineering. In 1986, he received a Masters in Business Administration from Wilkes University (formerly Wilkes College, Wilkes-Barre, PA). His early career consisted of supporting customer energy conservation efforts as an employee of Pennsylvania Power & Light Company (PPL) in Allentown, PA, where he eventually became a Key Account Manager for PPL's largest customers at the time, including Bethlehem Steel and BOC Gases. During his 17-year tenure at PPL, he performed many commercial and industrial customer site surveys, inspecting energy-related systems such as space heating and cooling equipment, water heating, industrial processes and insulation. Zack left PPL in 1995 to become VP, Energy Services for Commercial Utility Consultants in West Chester, PA, where he supported the company's customer cost-reduction efforts.

In 2000, Zack started his own consulting business, Integrity Engineering, LLC. Following a move to the Jersey shore in 2003, Zack increased his service offerings by performing home and commercial property inspections, and structural evaluations. He became a NJ-licensed home inspector in 2005 when the licensing law became effective. In 2006, he started sister company AtlantiCape Inspections, LLC, exclusively to serve the residential and small commercial inspection market, while maintaining Integrity Engineering, LLC for engineering-related technical inspections and audits.

Most recently, Zack has performed a number of residential and commercial structural inspections in Pennsylvania and New Jersey for flood insurers, following a series of serious flood events in 2011 including the March nor'easter, Hurricane Irene in August and Tropical Storm Lee in September. Consequently, Zack has seen many types of foundations and foundation damage from flooding, deficient construction and age-related deterioration. Additionally, he has been called upon by home and condominium owners and condo associations to assess structural defects relating to water intrusion.