**Unit 7 Outline**

**Learning Objectives**

Study of this unit should enable the student to

* measure the gross living area of a structure
* define curb appeal
* compare and contrast: ranch, Cape Cod, two-story, split-level, and split-entry;
* critique a house and lot in terms of its orientation, topography, and view;
* identify the various components of a house from a diagram;
* identify common radon entry routes; and
* explain the term “low-E glass.”

**Unit Outline**

I. Overview

II. Building Planning and Design

A. Regulation of Residential Construction

1. Building codes—merger of BOCA and the regional U.S. codes organizations resulted in formation of the *International Code Council.*

2. FHA and VA standards

B. Plans and Specifications

1. Must comply with building codes

2. Must show construction details of the house

3. Must contain specifications establishing the quality of materials and workmanship required

4. Architects may become members of American Institute of Architects (AIA)

5. Other specialists include mechanical engineers, structural engineers and soil engineers

6. Building Measurement—appraiser should verify all measurements personally and base all measurements on the same standard for consistency

a. Gross living area (GLA)—total amount of finished, habitable, above-grade space, measured along outside perimeter—generally, attics and basements not included

b. Gross building area (GBA)—for multifamily residences and industrial buildings—all enclosed floor areas (including attics and basements) measured along the building's outside perimeter

c. Gross leasable area (GLA)—for shopping centers—total space designed for occupancy and exclusive use of tenants (including basements), measured from outside wall surfaces to the center of shared interior walls

C. House Styles

1. Traditional Styles—Figure 7.1

2. Contemporary Styles—Figure 7.2

D. House Types—Figures 7.3 and 7.4

1. One-Story

2. One-and-a-Half-Story—Cape Cod

3. Two-Story

4. Split-Level

5. Split-Entry—raised ranch

6. Factory-Built Houses

a. Manufactured house

b. Modular house

c. Panelized house

d. Precut house

E. Orientation: Locating the House on the Site

1. Topography—lay of the land

2. Facing to the South—southern exposure to take advantage of winter sunshine (Figure 7.5)

3. View—best view for main living areas

4. Division of outdoor space—public, service and private zones

5. House plans—interior design or layout of a house

a. Floor plan—shows what the interior of the house looks like

b. Architectural or building plan---shows exact specifications of each building component

c. Landscaping plan—shows placement of any separate structure, as well as trees, shrubbery, and planting beds

# Exercise 7-1

III. Construction Details

A. Foundations—substructure

1. Concrete Slab—Figure 7.6

a. Monolithic

b. Floating

2. Pier and Beam (Figure 7.7)—over crawl space, utilizing piers, footings, sills, anchor bolts

3. Termite Protection—chemical treatment and metal termite shields

4. Radon Gas (Figure 7.8)—found in most rocks and soils—can enter home through dirt floors, cracks in foundation, etc.—high radon levels in the house can increase risk of lung cancer

B. Exterior Structural Walls and Framing

1. Framing (Figure 7.9)—studs, plates, foundation wall, firestops

a. Platform Frame—one floor at a time

b. Balloon Frame—studs extend continuously from base of first floor to ceiling of second floor, which rests on ledger boards or ribbon boards

c. Post and Beam Frame—ceiling planks supported on beams that rest on posts

2. Exterior walls—exterior sheathing and siding, masonry veneer or solid masonry (with outlets called weep holes)

3. Insulation—exterior walls, upper floor ceilings, and crawlspaces—R-value determines effectiveness

a. Insulation guidelines--DOE's minimum R-values are specific to zip code areas and take into account climate, heating and cooling needs, types of heating used, and energy prices

b. Asbestos and urea-formaldehyde foam insulation (UFFI)— no longer used because it is believed to cause cancer if its fibers get into the lungs

C. Roof Framing

1. Roof designs (Figure 7.10)—such as gable, hip, flat, gambrel, mansard

2. Roof construction—includes rafters, sheathing, exterior trim, or frieze board

D. Roof Coverings—key design element as well as a barrier against rain and snow

1. Materials include asphalt shingles, wood shingles and shakes, tile, metal, slate, and concrete

2. Exterior Trim—eave (cornice) (Figure 7.11), frieze board, fascia board

E. Exterior Windows and Doors—the term fenestration refers to the design of windows, doors and other exterior openings of a building

1. Types of Windows (Figure 7.12)—wood, metal

a. Sliding windows

i. Double-hung window

1. Single-hung window

iii. Horizontal sliding window

b. Swinging windows—casement, jalousie

c. Fixed windows

d. Storm windows

e. Skylights—provide natural illumination and solar heat

2. Energy-Efficient Windows

a. R-value, a standard energy rating that measures window efficiency

b. Low-emissivity (low-E) glass has glazing that improves energy performance

3. Noise Pollution—factors ranging from window design and materials to installation techniques affect the noise level in homes

4. Types of Doors (Figure 7.13)

a. Flush doors

b. Panel doors—stiles (vertical members) and rails (horizontal members)

c. Sliding glass doors

d. Storm and screen doors

5. Location of Exterior Doors

F. Interior Walls and Finishing

1. Interior walls

a. Plasterboard finished by taping and floating

b. Lath and plaster

2. Floor covering—vinyl, asphalt tile, wood, carpet, brick, stone, or terrazzo tile over wood or concrete subflooring

3. Trim—wood or vinyl

4. Cabinet work—custom made on site or prefabricated

5. Wall covering—paint and wallpaper, as well as ceramic, granite, marble, glass, concrete, manufactured stone, and other materials are used as wall, counter, or floor coverings

6. Lead-based paint—assumed in any structure built before 1978

G. Plumbing—water supply system, drainage system, vent piping system, waste collecting system, house connection pipe system

1. Plumbing Fixtures—cast iron, pressed steel coated with enamel, ceramic, glass, and other materials

2. Water Heaters—range from 17 to 80 gallons, with on-demand system popular because of its potential energy savings

H. Heating and Air-Conditioning

1. Bacteria, fungi, and molds can cause disease, allergic reactions, and respiratory illness

2. Output measured in British Thermal Units (BTUs)

3. Solar Heating

a. Passive (Figure 7.5)—no mechanical parts

b. Active (Figure 7.14)

I. Electrical System—National Electrical Code (NEC) safety requirements

1. Circuit breaker box (fuse panel in older homes)

2. Power Requirements

a. Capacity—110-volt (older homes), 220-240-volt (preferable)

b. Amperage—strength of a current--minimum capacity 100 amperes

3. Electromagnetic Fields (EMFs)

a. No conclusive evidence of any harmful effects of EMFs

b. Public perception of a problem—even if in error—may have an effect on the value of property located close to high-voltage transmission lines

c. Local utility companies beginning to offer EMF assessments of homes

4. Green Building—helps reduce negative impact on the environment

a. United States Green Building Council (USGBC) has developed the Leadership in Energy and Environmental Design (LEED) green building rating system

b. United States Environmental Protection Agency’s Energy Star program rates commercial buildings for energy efficiency and provides Energy Star qualifications for new homes

# Exercise 7-2

# Basic Building Terms

# Summary

# Review Questions