After studying this chapter, you will be able to:

- Map a circulation pattern and evaluate its quality.
- Identify the specific activities and areas involved in family, work, service, and guest circulation patterns.
- Determine the utility of a floor plan in relationship to a family's needs.
- Identify the seven types of drawings included in a set of house plans and explain their purposes.
- Interpret the symbols on a plot plan, foundation/basement plan, floor plan, exterior elevation, electrical plan, and construction detail drawing.

**Key Terms**

circulation
circulation frequency
plot plan
floor plan
exterior elevations
electrical plan
construction details
pictorial presentation
climate control plan
plumbing plan

The starting point for evaluating a floor plan is to make a list of your needs and wants related to housing. This list can help you decide which type of housing is most desirable for a specific situation. It can help you determine how much space is needed and how the space should be divided for the most effective use.

The first items on your list should meet absolute needs. These include bedrooms, baths, storage closets, and room for all necessary furniture and appliances. After listing all these needs, begin listing other features that are wanted in the home. Housing wants might include a fireplace, patio, or room for table tennis equipment. Try to be farsighted when making this list so changing needs can be met in the future.

Once you know what is needed and wanted in a home, begin examining floor plans. In each floor plan, identify the three main areas of the home. (Chapters 3, 4, and 5 provide in-depth analyses of these areas.) The three main areas are the living, sleeping, and service areas.

- **The living area** includes the living room, dining room, and family or recreation room. It also includes special rooms, such as a study, den, library, music room, or hobby room, as well as entryways, patios, and porches.
- **The sleeping area** includes the bedrooms, bathrooms, and dressing rooms.
- **The service area** includes other rooms, such as the kitchen, clothes-care center, utility room, basement, and garage.

As you study a floor plan, you may want to shade each of the three areas with a different colored pencil. This should help you visualize the location and contents of each area more easily. In most good plans, the rooms in each area are grouped to form a compact unit since they share similar functions. Compare the plans in 2-1 and 2-2 to see how the grouping of areas differs.

**2-1** In this plan, the rooms in each area—service, living, and sleeping—are grouped together. This is usually a sign of a convenient, well designed floor plan.

**2-2** The sleeping and service areas are divided in this floor plan. Although some efficiency is lost as a result, many households would find the plan satisfactory.
Circulation

If you have identified the three areas of the home on a floor plan and you like how they are grouped, the next step is to map the circulation. Circulation is the route that people follow as they move from one place to another in the home. Circulation is not limited to hall space; it may pass through a room. Generally 3 to 4 ft. of space should be allowed for circulation paths.

When reviewing the circulation of a floor plan, it is important to check not only what routes are followed, but also how often they are followed. Circulation frequency refers to the number of times a route is repeated in any given period. Generally, routes with high circulation frequency are short and direct in a good floor plan. The habits, needs, and special considerations of a household also affect the quality of circulation. Therefore, a given plan may be good for one household but not another.

Types of Circulation

The four basic types of circulation patterns are family, work, service, and guest. Each type of circulation should be mapped and identified as you evaluate the floor plan. See 2-3. Use different colored pencils for the different patterns. This procedure should help you evaluate the efficiency of the floor plan.

Family Circulation

Family circulation is the most complex and difficult pattern to identify. Members of each household have different living habits that produce different circulation patterns. Try to map movements on a room-to-room activity-to-activity basis. A good family circulation pattern usually follows these principles:

- A bath is located close to the bedrooms.
- The indoor living area is readily accessible to an outdoor living area such as a patio or deck.
- Related rooms are close together.
- High-frequency circulation routes are short and simple.
- Excessive hall space is avoided.
- Rooms are not cut in half by circulation routes.

A floor plan that follows these principles is likely to be convenient for household members.

Guest Circulation

This circulation pattern is the easiest to define. It simply involves movement from the entry to the coat closet and to the living room with access to powder room facilities. Guests should be able to move from the entry to the living area without passing through other rooms. A small house or apartment may not have a separate foyer or entrance area. In this case, guests may enter directly into the living room. They still should have access to a coat closet and powder room without having to pass through the main part of the living room.

Circulation Frequency

After the various circulation patterns are identified and analyzed, they should be evaluated in terms of circulation frequency. For example, how often does a family member walk from the recreation room to the kitchen compared to a guest walking into the living room? If dozens of family trips occur for each guest’s visit, obviously the route from the recreation room to the kitchen should receive higher priority. It should be shorter and more direct than the guest’s circulation route. This example shows that even though a floor plan may have a good circulation pattern, it may not meet the needs of household members because of their particular circulation-frequency patterns.

Realistically, all floor plans are compromises. One plan may have a perfect service circulation, while another has excellent family circulation. Still others may be average on all counts. The main goal is to judge how compatible the floor plan and circulation patterns are with the lifestyle of household members.

Room Relationships

The satisfaction household members receive from their living space is determined largely by the floor plan of their home. Other factors influencing satisfaction are the shapes and sizes of the rooms and the relationship of each room to the others.

The size of a room is not always an accurate indication of its usable space. 2-4. Poorly located doors, windows, and closets, or too many architectural features interrupting wall space, can greatly reduce usable space. See 2-5. When evaluating floor plans, study the potential for furniture arrangement and circulation within each room.

The relationship of one room to another dictates how functional the space will be. For example, the dining area should be located adjacent to the living room for convenience in entertaining. The dining area should also be located next to the kitchen for ease in serving food. If the plan has more than one 

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2-3 To evaluate the circulation efficiency of a floor plan, draw the family, work, service, and guest circulation patterns on the plan.
dining area, the most frequently used area should receive priority. It should be closest to the kitchen. If food is often prepared or served on a patio or porch, that area should also be located near the kitchen.

The relationship between bedrooms and bathrooms deserves attention because convenience, accessibility, and privacy are important. These rooms should be close together for convenience. For good accessibility, at least one bathroom should be located where people can reach it without having to go through another room. Finally, privacy should be considered in terms of both sight and sound.

The floor plan in 2-6 shows logical and functional room relationships. The dining room is adjacent to both the living room and the kitchen. Another, smaller eating area is located near the family room. The living room is large enough to accommodate several people. The walkway along one side promotes good circulation and adds space to the room. A coat closet and powder room are easily accessible to guests. All the bedrooms are near the bath and linen closet. The bath is centrally located, which is important since the plan includes only one bath. A second bath (for the master bedroom) could replace the current exterior storage.

Reading House Plans

A typical set of house plans, also called construction drawings, generally includes the following seven specific drawings:

- plot plan
- foundation/basement plan
- floor plan
- exterior elevations
- electrical plan
- construction details
- pictorial presentations

These drawings, together with a set of specifications, form the basis for a legal contract between the owner and builder. The specifications describe the quality of materials and construction techniques to be used. The specifications take precedence over the drawings in the event of a disagreement.

Description of Drawings

The following descriptions of the drawings generally found in a set of construction plans are intended to communicate the role that each drawing plays in the total plan.

The plot plan shows the location of the structure on the site. See 2-7. Its scale is generally 1 in. equals 20 or 30 ft. A plot plan shows the following items:

- location, outline, and size of building(s) on the site
- streets, driveways, sidewalks, and patios
- location of utilities
- easements for utilities and drainage (if any)
- fences and retaining walls
- length and bearing of each property line
- contour of the land
- trees, shrubs, streams, and gardens
- elevation of property corners
- meridian arrow (north directional symbol)
- well and septic tank and field (if any)
- lot number or address of the site
- scale of the drawing

The plot plan is drawn using information provided by a surveyor and recorded on a site plan. The plot plan shows both the property and the proposed construction. Lending agencies, building inspectors, and excavators all need this drawing.

The foundation/basement plan shows the location of the basement on the site. See 2-7. Its scale is generally the same as the plot plan. The foundation/basement plan shows the following items:

- location and size of footings, piers, columns, foundation walls, and supporting beams of the structure. See 2-8.
2-7 A typical plot plan shows the location of the structure on the site and other pertinent features.

2-8 The foundation/basement plan is used for excavation and construction of the footings and foundation walls.
A foundation and/or basement plan ordinarily includes the following items:
- footings for foundation walls, piers, and columns
- foundation walls
- piers and columns
- dwarf walls (low walls)
- partition walls, doors, and bath fixtures
- furnace, water storage tank, water softener, hot water heater, and so forth
- openings in foundation walls such as windows, doors, and vents
- beams and pilasters
- direction, size, and spacing of floor joists
- drains and sump (in basement)
- details of foundation and footing construction
- grade elevation
- complete dimensions and notes
- scale of the drawing

The foundation plan is prepared mainly for the excavator, masons, and cement workers who build the foundation. Generally, a scale of ¼ in. equals 1 ft. is used.

The floor plan is the heart of a set of construction drawings and is used by all tradespeople. See 2-9. The floor plan is actually a section drawing for each floor of the structure, taken about 4 ft. above the floor. A scale of ¼ in. equals 1 ft. is used for the drawings.

The floor plan generally includes the following items:
- exterior and interior walls
- size and location of windows and doors
- built-in cabinets and appliances
- permanent fixtures
- stairs and fireplaces
- porches, patios, and decks
- room names and approximate sizes
- material symbols
- location and size dimensions
- scale of the drawing

Exterior elevations are drawings that show the size and height of a building. Each side of the building requires a separate elevation. See 2-10. The scale for these drawings is usually ¼ in. equals 1 ft. Most exterior elevations include the following items:
- identification of the specific side of the building that it represents
- grade lines (level of the soil against the building)
- depth of foundation (in hidden lines)
- finished floor and ceiling levels
- location of exterior wall corners
- windows and doors
- roof features and materials
- roof pitch
- chimneys
- deck railings and outside steps
- patios, decks, and porches
- exterior materials
- vertical dimensions of features
- scale of the drawing

The electrical plan is similar to the floor plan in appearance. However, the purpose of the electrical plan is to show the locations and types of electrical equipment to be used in the structure. See 2-11. The electrical plan is generally in a scale of ¼ in. equals 1 ft. Most electrical plans include the following items:
- meter and distribution panel
- electrical outlets
- light fixtures
- switches
- telephone
- doorbell and chimes
- circuit data (optional)
- lighting fixture schedule (optional)
- appliances that use electricity
- home security system
- scale of drawing

Construction details are drawings that provide detailed information to fully describe the construction of special architectural features. See 2-12. Typical details include the following:
- foundation and footing details
- typical wall sections
- truss details
- fireplace and chimney details
- stair details
- kitchen and chimney details
- window and door details
- flower planters
- decorative screens
- soffit details
- unique construction
- built-in cabinets, bookcases, and so forth

2-9 A floor plan is drawn for each above-grade level of the structure. The floor plan forms the heart of a set of construction drawings.
2-10 An exterior elevation is drawn for each side of a building to show the finished appearance. Here, the front and rear views are shown.

2-11 An electrical plan for each floor of the building is prepared to show the locations and types of electrical equipment to be used.
Chapter 2  Evaluating Floor Plans

The scale of these drawings is almost always larger than ¼ in. equals 1 ft. Typically, ½ in., ¾ in., 1 in., or 3 in. are used to represent 1 ft. Often included in the package of drawings are pictorial presentations. These are realistic renderings, often in color and proper perspective, used to better communicate the finished appearance of a structure. Presentation drawings rendered in color make the drawing more lifelike. These communication devices are intended primarily for those who cannot visualize the completed product from the construction drawings.

Other Drawings

In rare cases, a set of residential construction drawings may include a climate control plan and a plumbing plan. These, however, are more likely to be included in the construction drawings for a larger building such as an apartment or condominium complex.

A climate control plan shows the location of the heating, cooling, humidification, dehumidification, and air cleaning equipment. It also shows distribution routes and the means of transmitting the conditioned air to the various rooms.

A plumbing plan shows the freshwater supply lines to the water storage tank or house main as well as wastewater lines, water conditioning equipment, and plumbing fixtures. Such fixtures include sinks, water closets, showers, and tubs.

Construction drawings are very useful. Often, problems during the building process are avoided because they are solved on paper before the building begins. (For related information, see A-1 through A-6 of the Appendix.)

Chapter Summary

The area or space in a dwelling is represented by a floor plan. The way to begin evaluating the plan is to make a list of the needs and wants of those who will occupy the space. This is a very personal step that, if done well, will result in highly effective housing for the home’s occupants.

A major consideration in evaluating the arrangement of space in a specific floor plan includes plotting the four basic types of circulation routes. Analyzing circulation frequency further defines the efficiency of the plan for a given household.

The size, shape, and relationship of one room to another largely determine the satisfaction that household members receive from their living space. Other factors include usable space, privacy, and accessibility.

A typical set of house plans generally includes at least seven basic types of drawings. Each contains specific information that is necessary to provide a complete picture of the new structure to everyone involved with it.

Review Questions

1. How does circulation frequency affect the type of path allowed for circulation?
2. What are the four basic types of circulation?
3. What principles should a good family circulation pattern follow?
4. Why is it important for work areas to be small and free of cross-traffic?
5. For the most efficient service-circulation pattern, where should a service entrance be located?
6. What parts of the house are involved in guest circulation?
7. What features may cause a large room to have a greatly reduced amount of usable space?
8. What rooms should be placed adjacent to the kitchen? far from the kitchen?
9. What specific drawings are included in a typical set of house plans?
10. If information in a house’s floor plan conflicts with its specifications, which is considered correct?
Suggested Activities

1. Interview everyone in your household who is school age or older to record each member's needs and wants in terms of housing. Their needs might include items such as rooms, storage, furniture, and appliances. Their wants might include items such as a study, fireplace, patio, or room for table tennis. Prepare a chart that displays all the interview comments and identifies those points on which two or more members agree.

2. Sketch a floor plan of your residence and, using different colored pencils, shade the living, sleeping, and service areas. Study the efficiency of the plan and make recommendations for improving the arrangement.

3. Reuse the floor plan prepared for Item 2 or sketch a floor plan of your residence. Map the circulation routes using different colored pencils to distinguish the four types.

4. Find a floor plan in a newspaper or magazine and analyze the functionality of its room arrangement. List the strengths and weaknesses of the plan in terms of the principles covered in this chapter.

5. Secure a set of residential construction drawings or use a set provided by your instructor. Identify the features shown on the plot plan, foundation/basement plan, floor plan, exterior elevations, electrical plan, and construction details.

6. Collect several different types of housing presentation plans from the Internet, magazines, or other sources. Explain to the class the purpose of each.

Internet Resources

American Institute of Architects
ala.org

Architectural Digest Magazine
archdigest.com

Better Homes and Gardens Magazine
bhg.com

Design Basics, Inc., a home design service
designbasics.com

SoftPlan Systems, Inc. residential design program
softplan.com

Studer Residential Designs
studerdesigns.com

The McGraw-Hill Companies, Inc. construction products marketplace
sweets.com

The Sater Design Collection, Inc.
saterdesign.com

Note: Web addresses may have changed since publication. For some entries, reaching the correct Web site may require keying www: into the address.