UNIT 12
Residential Framing Prints

TECHNICAL TERMS

balloon framing
bird's mouth
blocking
bridging
collar beam
common rafters
cripple jacks
cripple studs
fire stop
header
hip jacks
hip rafters
joist
knee walls
ledger
loadbearing partitions
on center (O.C.)
platform framing
post-and-beam framing
purlin
rafter
ribbon
ridge board
rise
riser
rough sill
run
sill plate
slope
sole plate
span
stringer
top plate
tread
valley jacks
valley rafters
winders

LEARNING OBJECTIVES

After completing this unit, you will be able to:

- List the differences between heavy framing and light framing.
- Recognize the construction of various floor, wall, and roof framing systems.
- Read framing drawings.
- Explain the differences between platform, balloon, and post-and-beam framing.
- Understand stair details and terms.
- Recognize metal framing systems.

The names of structural framing members used in residential construction are similar to those used in commercial construction. Beams and joists are used to support floors. Columns are used in situations where a wall would be inappropriate, such as open areas found in basements or open areas between large gathering areas.

However, there are several differences between heavy commercial frames and light residential frames:

- Wood members are more commonly used, rather than structural steel or concrete. See **Figure 12-1**. Wood frames are lightweight and easier to construct.
- Many more members are used in wood-framed residential structures, because the wood is relatively weak as compared to concrete or steel members.
- Walls are also constructed as a frame, with wood studs spaced every 12", 16", or 24" on center.
- Residential framing plans may include additional information, such as the roofing material, sheathing, and finish details.

Light-gage steel is sometimes used in residential frames instead of wood. However, the framing systems do not change significantly when steel members are used. When using light-gage metal framing, the system should be designed by an engineer for structural integrity.

Dan Dorfmueller

Figure 12-1. Wood is the most widely used framing material in residential construction, due to its flexibility and ease of use.

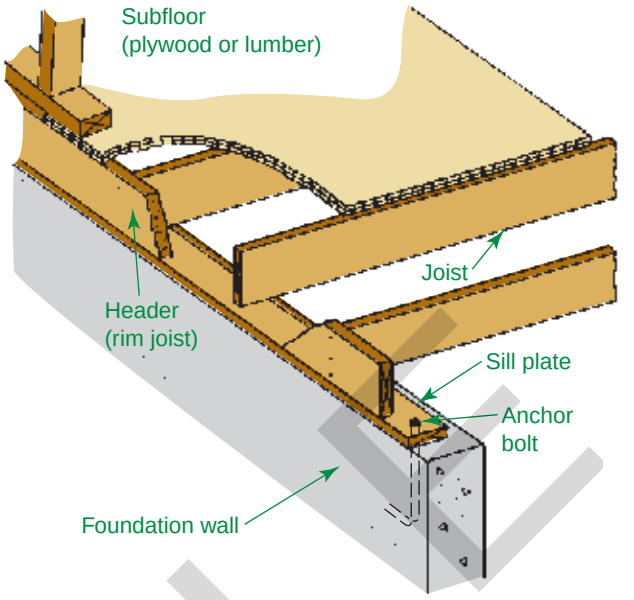

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Figure 12-2. Basic components of floor framing construction.

Residential foundation systems are similar to heavier structural systems used in commercial construction, except that residential foundations are much simpler in most situations. Usually, a residential foundation consists of concrete footings and loadbearing walls, and sometimes simple retaining walls. Residential foundation systems are discussed in Unit 10.

Wood Framing

Wood is the most widely used residential construction material. Its availability and affordability lead to its popularity and the methods of wood framing are widely known. Wood has proved to be a durable, dependable material for houses. The following sections describe the common wood framing systems used in residential construction and the manner in which each of these systems is shown on prints.

Floor Framing

The basic component terminology related to floor framing is described as follows. Typical floor framing and wall framing members used in residential construction are shown in **Figure 12-2**.

- **Sill plate**. The ***sill plate*** is a board attached to the top surface of the foundation wall. Anchor bolts cast in the concrete are used for the connection. A 2×4 or 2×6 member is often used for the sill plate.
- **Header**. The ***header***, also called a *rim joist*, is nailed to the top of the sill plate at its exterior edge. The header is positioned with its longer cross-sectional dimension vertical. The header is the same size as the joists that attach to it.
- **Joists**. ***Joists*** are horizontal floor-supporting beam members. The ends of the joists rest on the sill plate and are nailed to the header. Joists commonly span from the sill plate to an interior wall or a beam. See **Figure 12-3**. Joists are normally spaced 12″ to 16″ apart. Common lumber sizes used for joists are 2×8, 2×10, and 2×12. The joists shown in **Figure 12-3** are solid wood joists. Engineered wood joists are also available and are used for spanning longer distances. Members of this type can span distances greater than 30 feet. Wood I-joists, **Figure 12-4**, are engineered wood members commonly used in floor construction. Wood I-joists have flanges made from solid sawn lumber or laminated veneer lumber (LVL) and a web made from oriented strand board (OSB) or plywood. Open-web truss joists, sometimes called floor trusses, are also designed for long spans in floor construction. See **Figure 12-5**. These are engineered members usually composed of a top chord and bottom chord made from 2×4 lumber and a web made

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Figure 12-3. Wood floor joists framed over an interior loadbearing partition and foundation walls.

APA-The Engineered Wood Association

Figure 12-4. Wood I-joists are lightweight, high-strength framing members used for long spans. Common depths range from 9 1/2″ to 16″ and flange widths vary from 1 1/2″ to 3 1/2″. Member lengths up to 66′ are available.

from galvanized steel or wood. These members are capable of spanning longer distances than wood I-joists. The open-web design presents a number of advantages, including the ability to run ductwork, pipe, or electrical wiring through the openings. Manufacturers of wood I-joists and open-web truss joists provide load and deflection tables for determining allowable spans when using these members.

- **Subfloor**. The joists and header are covered with subflooring. A sheet material, such as plywood or chip board, is normally used. The subfloor is fastened to the joists using nails or screws. Often, construction adhesive is used to attach the subfloor to the joists before installing fasteners to strengthen the assembly. The finished floor, such as carpet, wood, or ceramic tile, will cover the subfloor.

Mark Herreid/Shutterstock.com

Figure 12-5. Open-web truss joists, also called floor trusses, are lightweight, high-strength members that have an open-web framework. The floor trusses shown have a web fabricated from wood members.

GREEN BUILDING

Engineered Wood Products

The development of modern engineered wood products has done much to support the movement toward green construction. According to the Engineered Wood Association, I-joists use 50% less wood than solid sawn 2× joists. LVL, frequently used for girders and rim boards, also conserves wood by providing the required strength characteristics while using less wood. Laminated strand lumber (LSL) further conserves resources because it can be manufactured from small-diameter, misshapen trees that would otherwise be unusable. Because engineered wood products can be purchased in any length, the waste at the construction site is greatly reduced.

Additional floor framing members are shown in **Figure 12-6**:

- **Double header**. When an opening that disrupts the framing pattern is needed, a double header is installed perpendicular to the joists. The same size member that is used for the joists is used.
- **Double trimmer**. A double trimmer consists of two joists nailed together next to an opening.
- **Tail joist**. This is a joist interrupted by an opening. Tail joists normally run between the double header and the sill plate.
- **Ledger**. A ***ledger*** is a small piece of lumber, such as a 2×2, nailed to the side of the double header, at its bottom edge. This piece serves as a ledge on which each tail joist rests. A notch must be cut into the joist to keep the top of the joist even.
- **Bridging**. ***Bridging*** consists of small members connected between the sides of adjacent joists to provide bracing. Bridging provides lateral stability for the joists and helps to transmit the load between the joists. Many types of bridging are used, including joist-sized members, crossed 2×4s, and crossed sheet metal bars.

The floor framing system is often shown on the floor framing plan. The sizes of the members are given and marks or arrowheads are used to indicate the direction of the span. A note is typically used to specify dimensions for joists:

2×12 JOISTS 16″ O.C.

This designation means that a 2×12 member is used for each joist and the joists are spaced 16″ from one another ***on center (O.C.)***. A measurement specified with the abbreviation *O.C.* or *o/c* refers to the distance between the centers of the adjoining building components.

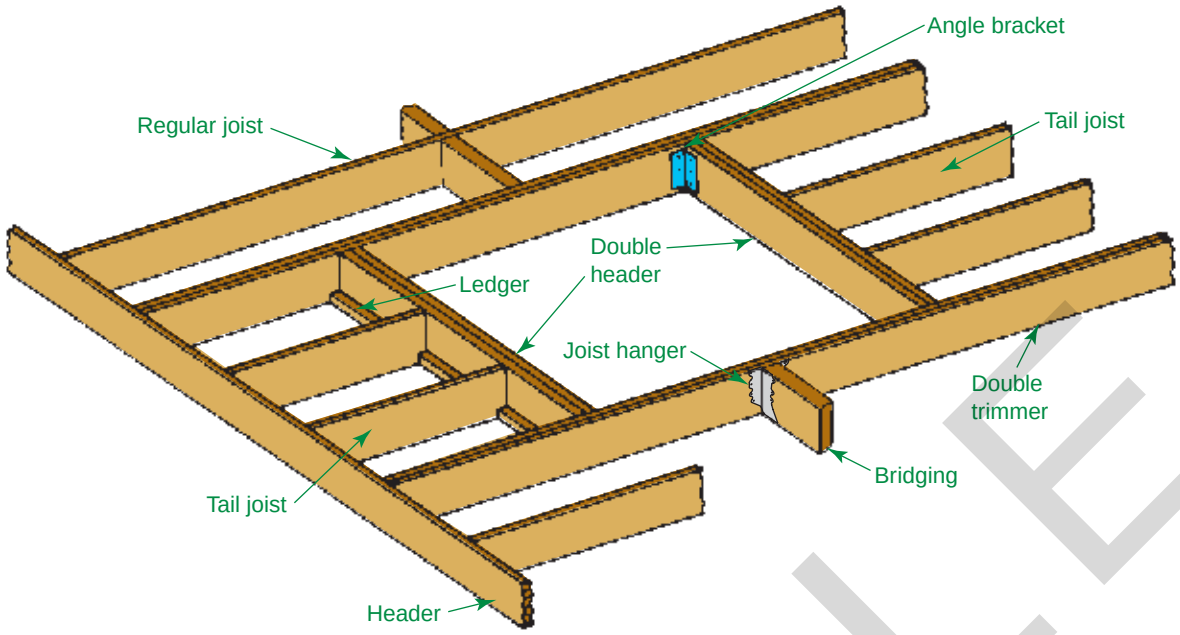

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Figure 12-6. Additional floor framing members.

Joists on a plan represent the joists above the level shown. For example, joists shown on a foundation plan would be located *above* the basement and below the first floor. See **Figure 12-7**.

Dimensioning Floor Framing

Normally, dimensions for exterior walls are given to the outside of the stud wall for frame and brick veneer buildings, **Figure 12-8A**. A note may be added to the drawing to read:

NOTE: EXTERIOR DIMENSIONS ARE TO OUTSIDE EDGE OF STUDS; INTERIOR DIMENSIONS ARE ALSO TO EDGE OF STUDS WITHOUT DRYWALL OR FINISH MATERIAL. SPECIAL ATTENTION MUST BE GIVEN BETWEEN THE OUTSIDE EDGE OF THE CONCRETE AND THE EDGE OF THE WOOD FRAMING SO THAT ALL EXTERIOR FINISHES COORDINATE PROPERLY.

As noted in Unit 5, some architects follow a different practice. They start the dimensions for single-story frame buildings at the surface of the wall sheathing (which

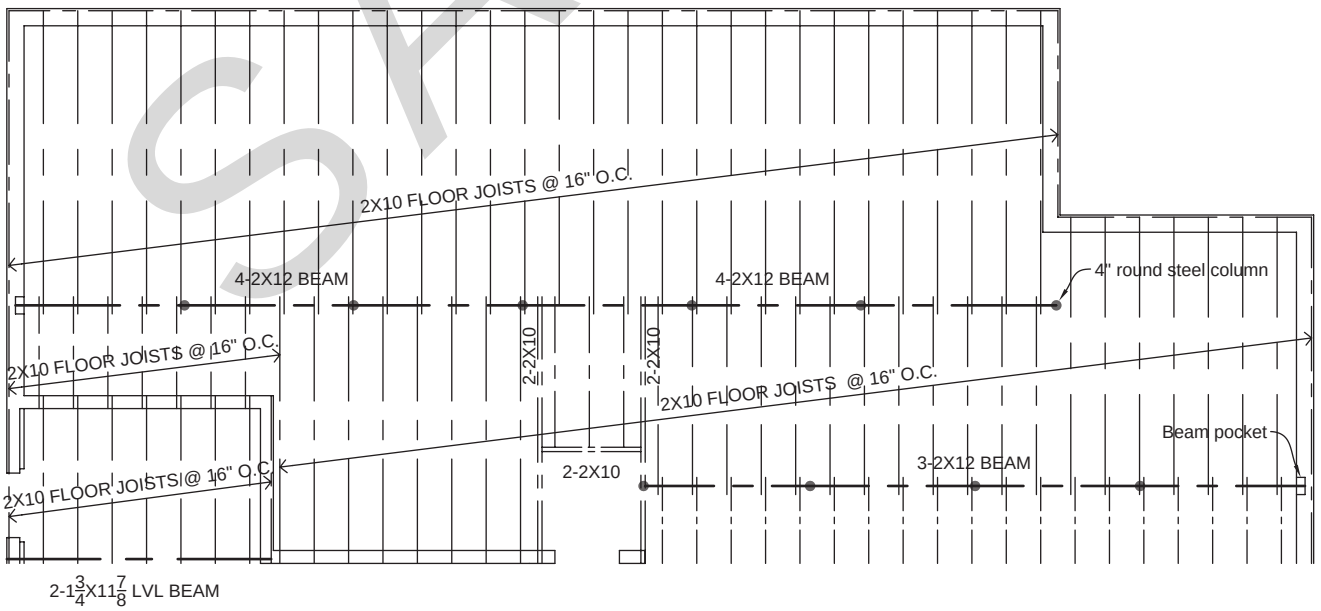

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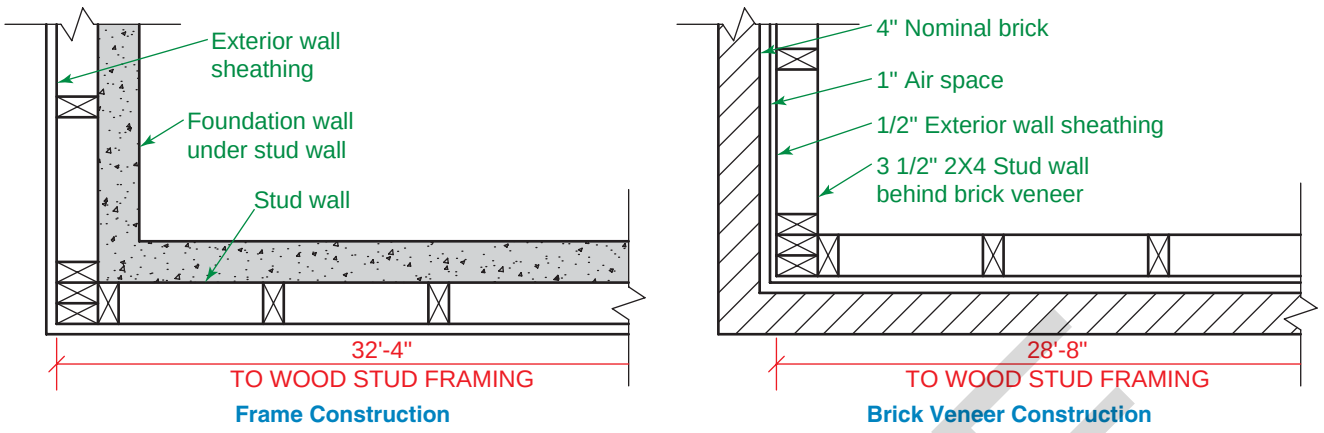
Figure 12-7. A partial residential floor framing plan showing locations and dimensions for joists.



A

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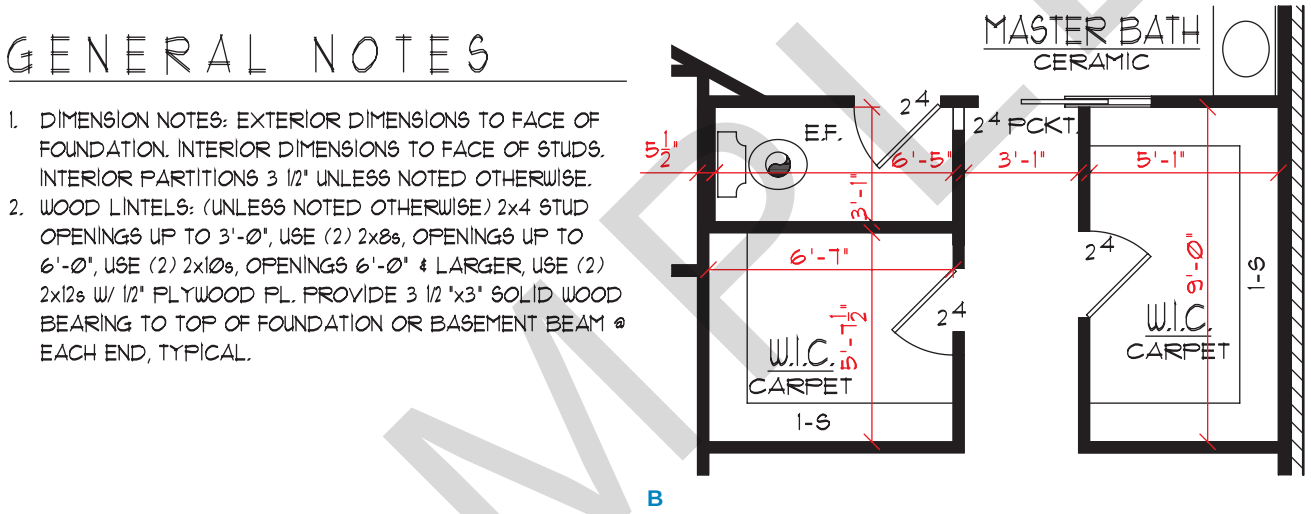

B

Eagle Custom Homes; McGill Smith Punshon, Inc.; Superior Designs, LLC

Figure 12-8. Dimensioning practices for walls. A—Dimensions for exterior walls. The dimensions shown in color are to the face of the stud wall. B—Dimensions for interior walls. The dimensions shown in color are to the face of studs, as noted.

should align with the foundation wall), rather than the outside of the studs.

Drawings should be checked carefully to verify the dimensioning practice used. Usually, interior walls of frame construction are dimensioned to their edges, as shown in **Figure 12-8B**, but sometimes they are dimensioned to their centerlines. Masonry interior walls are dimensioned to their faces, with the wall thickness also dimensioned.

When studying the floor plans of buildings with two or more stories, note the adjoining stairs, chimneys, and loadbearing partition walls.

In certain building styles, the floor is cantilevered out over the foundation wall. In these cases, special framing details are shown. See **Figure 12-9**. Houses that have second stories smaller than the first are called one-and-a-half story houses. These houses usually involve ***knee walls*** (short walls joined by a sloping ceiling) and dormers.

Split-level houses have floor plans in which the levels are separated by a half-flight of stairs. Many variations are called for in framing of this type of structure, so the plans should be studied carefully.

Wall Framing

There are three basic types of light frame construction: platform, balloon, and post-and-beam. The construction worker should be familiar with the three types and be able to distinguish between them on drawings.

Platform framing, also known as *western framing*, is the most widely used type. It gets its name from its appearance. The first floor is built on top of the foundation, so it resembles a platform when the subflooring is complete.

The first-floor wall sections are raised and a second-floor platform is built on top of these walls. Then, the second-floor wall sections are raised and another platform for the second-story ceiling is constructed. See **Figure 12-10**. Each floor is a separate unit built on the structure below.

Balloon framing is not used to any large extent today. In this type of framing, shown in **Figure 12-11**,

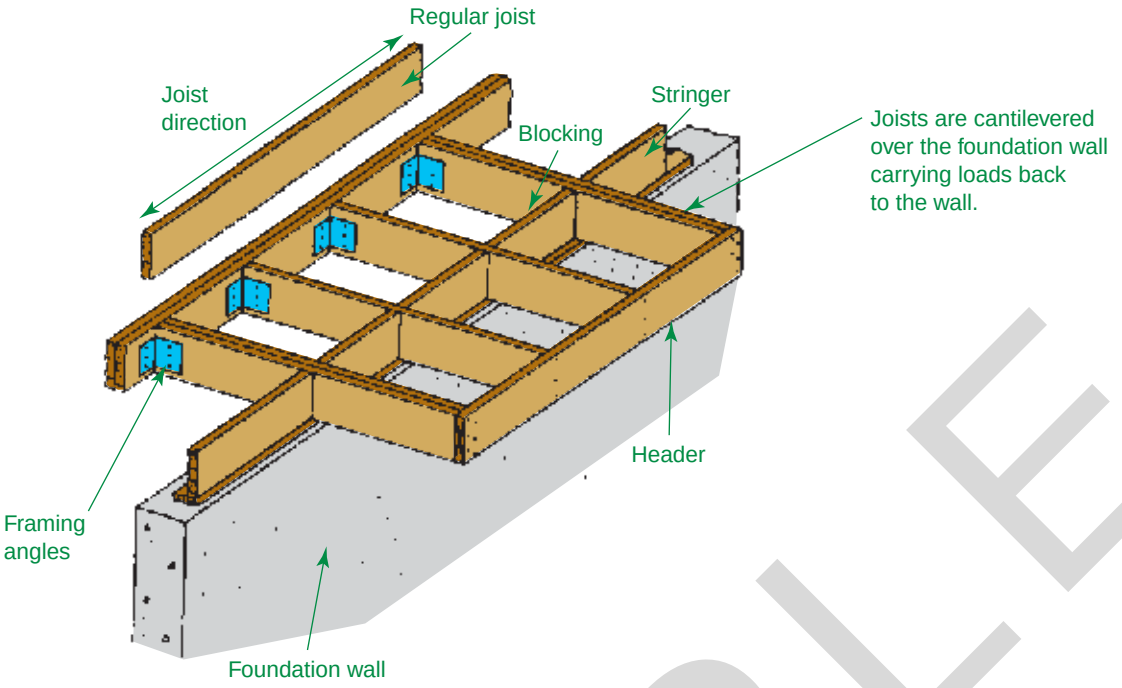

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Figure 12-9. Pictorial detail showing the framing of a cantilevered flooring system.

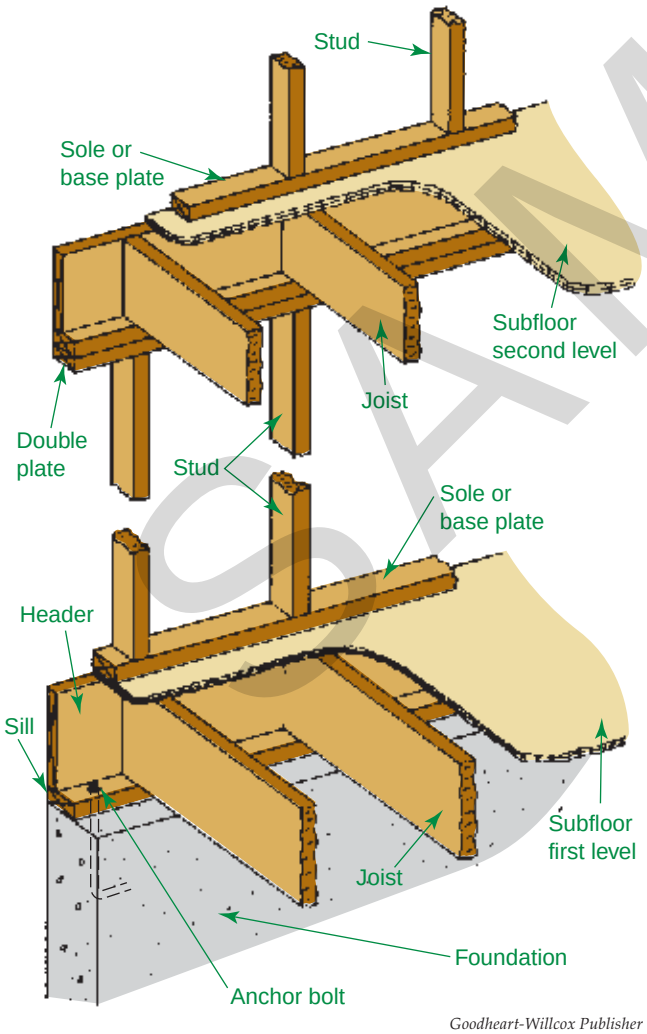

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Figure 12-10. An example and details of platform framing.

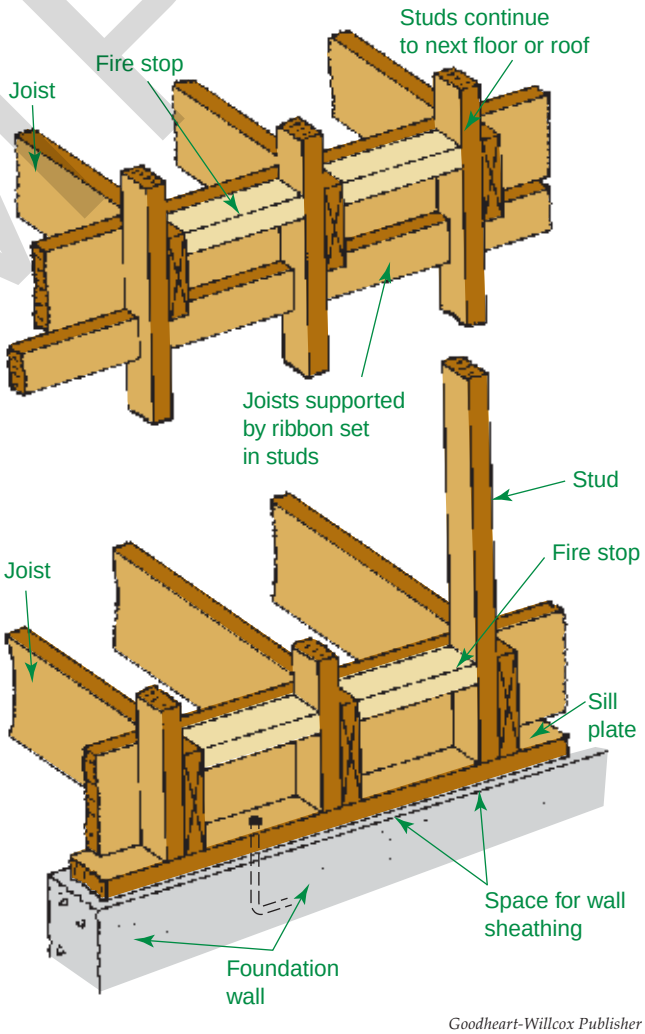

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Figure 12-11. An example and details of balloon framing.

the studs extend unbroken from the first floor sill plate to the top plate of the highest floor. Second-floor joists rest on a member called a ***ribbon***, which is set into the studs. Balloon framing has some advantages: it reduces lumber shrinkage problems in masonry veneer and stucco structures; it also simplifies running ducts and electrical conduit from floor to floor.

The main disadvantage of balloon framing is the tendency of the walls to act as flues in spreading fires from floor to floor unless blocking is added between studs. A block member used in this manner is called a ***fire stop***. Balloon framing is also more difficult to manage in assembling a wall section.

Post-and-beam framing consists of heavy timber material for vertical posts in wall sections and horizontal beams supporting floor and roof sections. The floor and roof sections are typically made from plank material 2″ thick. See **Figure 12-12**. The structural members are placed at wider intervals than in other methods of framing. This type of framing lends itself to interesting architectural effects and extensive use of glass and exposed wood sections.

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Figure 12-12. A residence making use of the post-and-beam system of framing.

Various components of wall framing are illustrated in **Figure 12-13**:

- **Sole plate**. This serves as a base for the wall frame. The ***sole plate*** is the same size member as the studs (normally 2×4 or 2×6) and is nailed to the subfloor.
- **Studs**. Studs are the vertical members in the wall frame, running from the sole plate to the top plate. Studs are normally 2×4 or 2×6 members.
- **Header**. When some studs must be left out to make room for a window or door, a header is used to distribute the weight of the building around the opening. Headers can be constructed in many ways: one of the most common is to turn two 2×4 members sideways and insert a 1/2″ spacer (to make the assembly 3 1/2″ thick, the same width as a 2×4). The header is then nailed in place. Some headers are made up of larger 2×6 or 2×8 members so they can span larger openings. A header schedule may be provided to indicate the 2× member size required to span each opening.
- **King stud**. A king stud is a stud located on either side of a header. It is a full-height stud that runs from the sole plate to the top plate.
- **Trimmer stud**. Next to the king studs and below the header, trimmer studs are placed. A trimmer stud extends from the sole plate to the bottom of the header. It is attached to both the king stud and to the header.
- **Rough sill**. A ***rough sill*** is positioned to support a window.

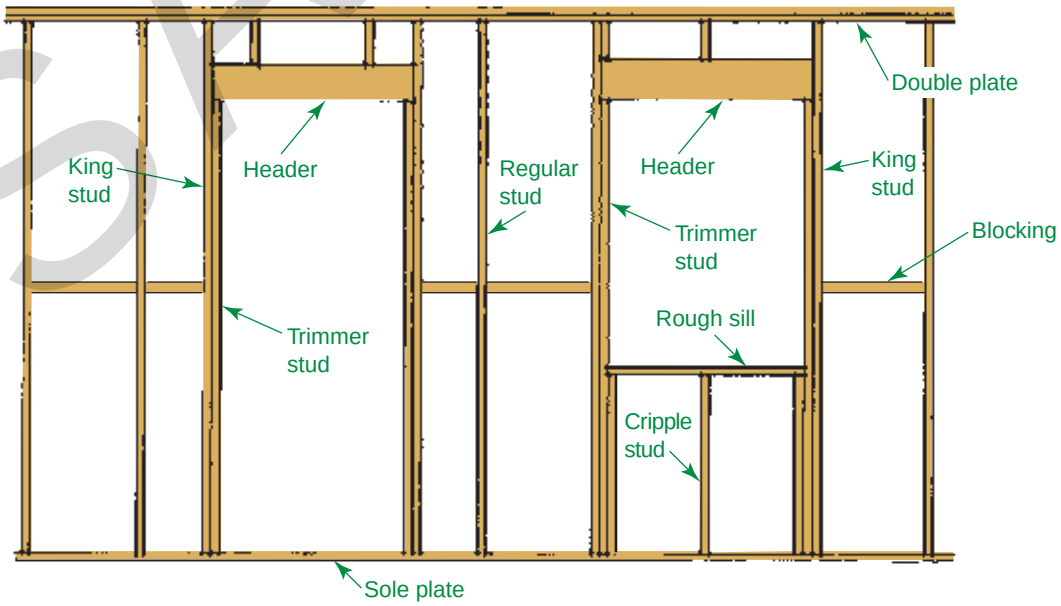

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Figure 12-13. Components of stud wall framing.

CAREERS IN CONSTRUCTION

Carpenter

As one of the oldest trades in construction, carpentry is still needed in almost every facet of the construction process. Carpenters are highly skilled workers who perform framing and finish work in residential and commercial structures.

Carpenters who construct the framing of a building are referred to as *rough framing carpenters*. Carpenters who perform finish carpentry work are called *finish carpenters*. The rough framing carpenter assembles the floor, wall, and roof framing. In addition, the rough framing carpenter builds the formwork used for concrete construction. The finish carpenter installs interior and exterior trim, builds or sets kitchen cabinets, sets windows and doors, installs finished hardware on doors, and so on. A finish carpenter must be much more precise in installation work than a rough framing carpenter.

Carpenters primarily work with wood components and light steel framing products. Carpenters must be able to work from prints and make accurate measurements when cutting and joining members. Carpenters must also be able to use a variety of hand and power tools safely and accurately.

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Carpenters are highly skilled workers. They must be able to measure accurately and use a variety of hand and power tools.

Most carpenters learn the trade on the job or through training in a trade school or apprenticeship program. Carpentry is a rewarding career that offers many benefits. With experience, a carpenter can advance into a position as a foreman, superintendent, and even project manager.

- **Cripple stud**. Short studs, called ***cripple studs***, extend between the top plate and header or the sole plate and rough sill. They are similar to trimmer studs, but are not paired with an adjacent stud.
- **Blocking**. ***Blocking*** is used to provide structural support and to prevent the spread of fire from floor-to-floor through stud spaces.
- **Top plate**. The ***top plate*** (shown in **Figure 12-13** as a *double plate*) rests above the studs. The next level of joists or rafters is supported by the top plate.

Interior walls that carry the ceiling or floor load from above are called ***loadbearing partitions***. Usually, they are located over a beam or bearing wall, **Figure 12-14**.

GREEN BUILDING

Insulated Headers

Headers are often sized to fill the space above the rough opening to the wall plate. Without any added insulation, this creates a tremendous thermal bridge. To cut heat loss and build greener headers, size headers properly and add a layer of rigid foam insulation between a built-up header's layers or to the exterior face.

Schedules

Door and window schedules give the number and size of all doors and windows in the building. See **Figure 12-15**. Units listed in the schedule are referenced

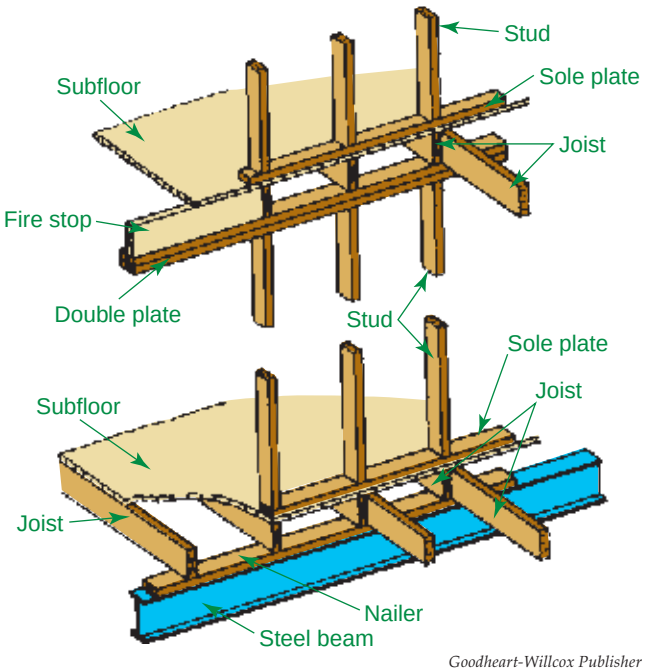

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Figure 12-14. Loadbearing partitions are used to transfer loads from floors above to the bearing structure below.

Door Schedule					
Mark	Type	Size	Material	Frame	Remarks
A	1	3'-0" × 7'-0" × 1¾"	Hollow Metal	Hollow Metal	Closer and Threshold
B	1	3'-0" × 7'-0" × 1¾"	Hollow Metal	Hollow Metal	Closer
C	2	2'-8" × 7'-0" × 1¾"	Hollow Metal	Hollow Metal	Closer and Kick Plate
D	2	3'-0" × 7'-0" × 1¾"	Hollow Metal	Hollow Metal	Closer
E	2	3'-0" × 7'-0" × 1¾"	Hollow Metal	Hollow Metal	Closer

Smith & Neubek & Associates

Figure 12-15. A typical door schedule.

to the plan view with a letter or number. Some architects provide the rough opening size in the schedules to speed construction and ensure a correct fit. If rough opening sizes for doors and windows are not provided, the construction worker must calculate them.

Sectional Views

Sectional views of walls are drawn to a larger scale and included on the drawings to clarify construction details. The section location is identified on the plan view with a section cutting line and reference symbol.

Full sections are cut through the width or length of a building, **Figure 12-16**. They are prepared for buildings with more complex frames, such as split-level houses or those with unusual interiors. These sectional views show features such as floors, walls, and ceilings as sections. Features beyond the cutting plane are shown as they appear in the interior of a building.

Roof Framing

Construction workers should be familiar with the different types of roof styles and how they are framed. Sketches of typical roof styles found in residential construction are shown in **Figure 12-17**. The style of the roof is most easily identified in elevation drawings.

Some architects do not supply a roof framing drawing for the more common roofs, such as gables or flat roofs, but rely on the elevation and detail drawings to guide the construction workers and the truss fabricator. When the roof is more complicated, or when the architect desires to specify the manner of construction, a roof framing plan is prepared, **Figure 12-18**. Roof framing can become very complicated and requires construction by skilled carpenters.

Figure 12-19 illustrates some common terms used in roof framing:

- **Rafter**. A ***rafter*** is one of a series of angled beam members that support the roof. A rafter is normally a 2×6, 2×8, or 2×10 member.
- **Ridge board**. A ***ridge board*** is the horizontal member at the peak of the roof. The upper end of each rafter is connected to the ridge board.
- **Collar beam**. This horizontal member ties the rafters together. A ***collar beam*** makes the roof frame more stable.
- **Rise**. The ***rise*** is the vertical distance between the top plate and the ridge board.
- **Run**. The ***run*** is the horizontal distance from the wall supporting the bottom of the rafter to the ridge board.
- **Slope**. The ***slope*** of the roof is the relationship between the rise and run. The slope describes the vertical rise in inches per 12″ of horizontal run. For example, a roof slope of 4:12 indicates that the increase in vertical height (rise) is 4″ for every 12″ of horizontal distance (run). On section and elevation drawings showing the roof of the structure, the roof slope is indicated with a slope symbol. See **Figure 12-20**.
- **Span**. The distance between the walls supporting the rafters is the ***span***. It is twice the length of the run.
- **Bird's mouth**. For the rafter to fit flush on the top plate, this cut must be made. The ***bird's mouth*** consists of two cuts: the *seat cut* and the *plumb cut*.

Figure 12-21 shows various types of rafters:

- **Common rafters**. ***Common rafters*** run at right angles from the wall plate to the ridge.
- **Hip rafters**. Rafters that extend from an outside corner of the building to the ridge board, usually at a 45° angle, are ***hip rafters***.
- **Valley rafters**. ***Valley rafters*** extend from an inside corner of a building to the ridge board, usually at a 45° angle.

GREEN BUILDING

Green Building Details

In high-wind or seismic zones, some green building techniques do not provide enough stability. Know regional and local building codes to account for environmental changes. Submit house plans with green building technique details noted to a building official for review and approval.

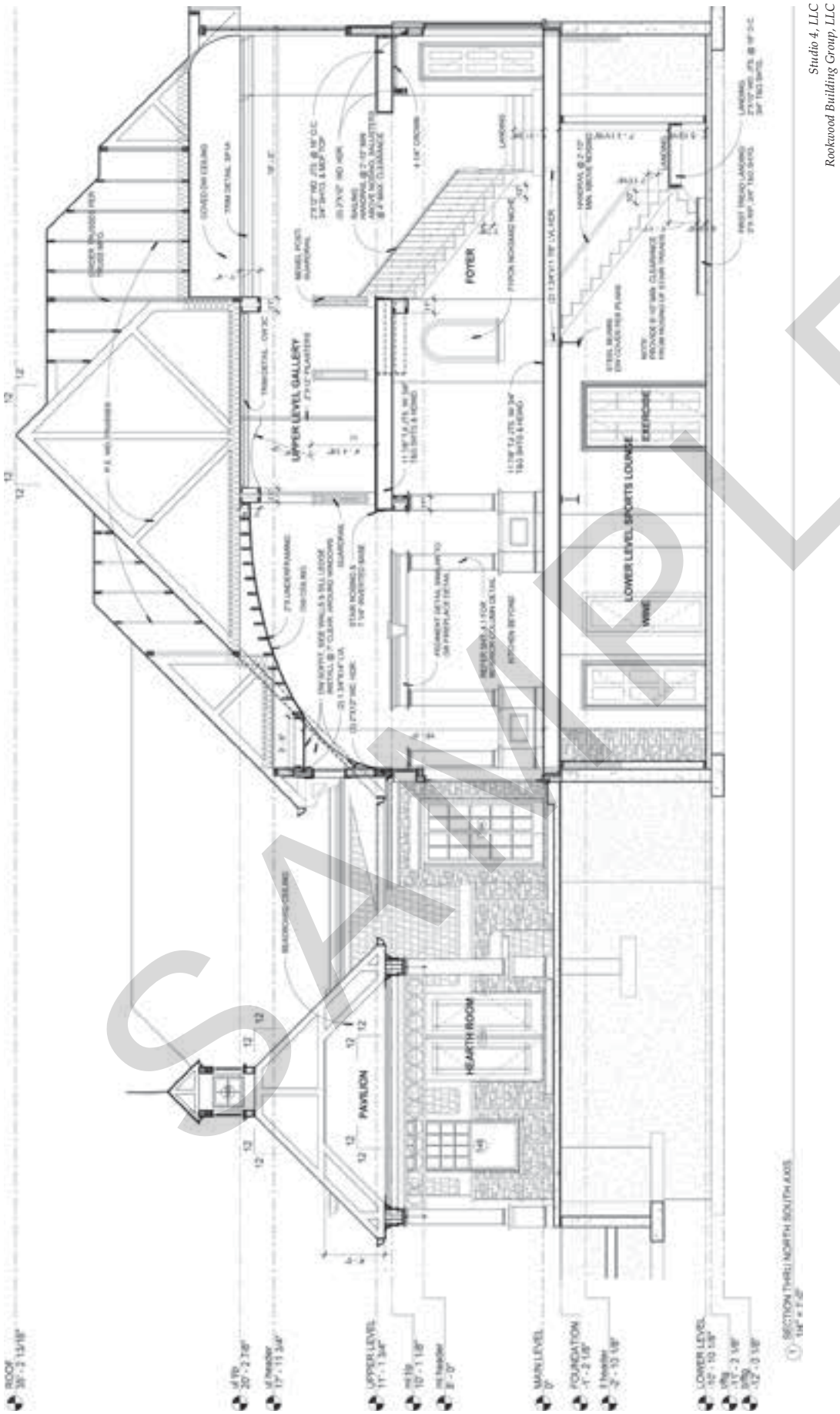

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Figure 12-16. A full section shows the entire building.

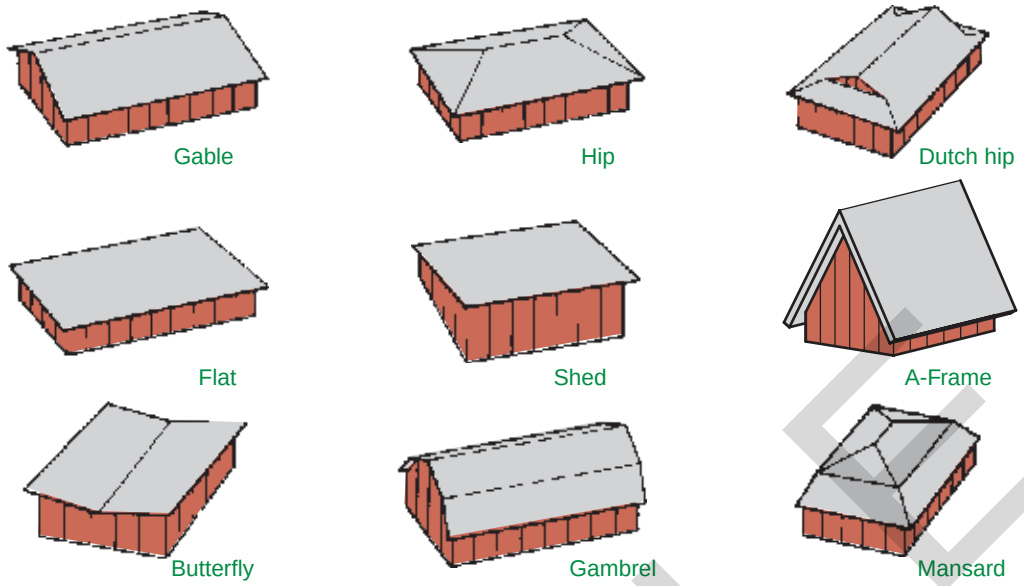

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Figure 12-17. Common roof styles and shapes used in residential construction.

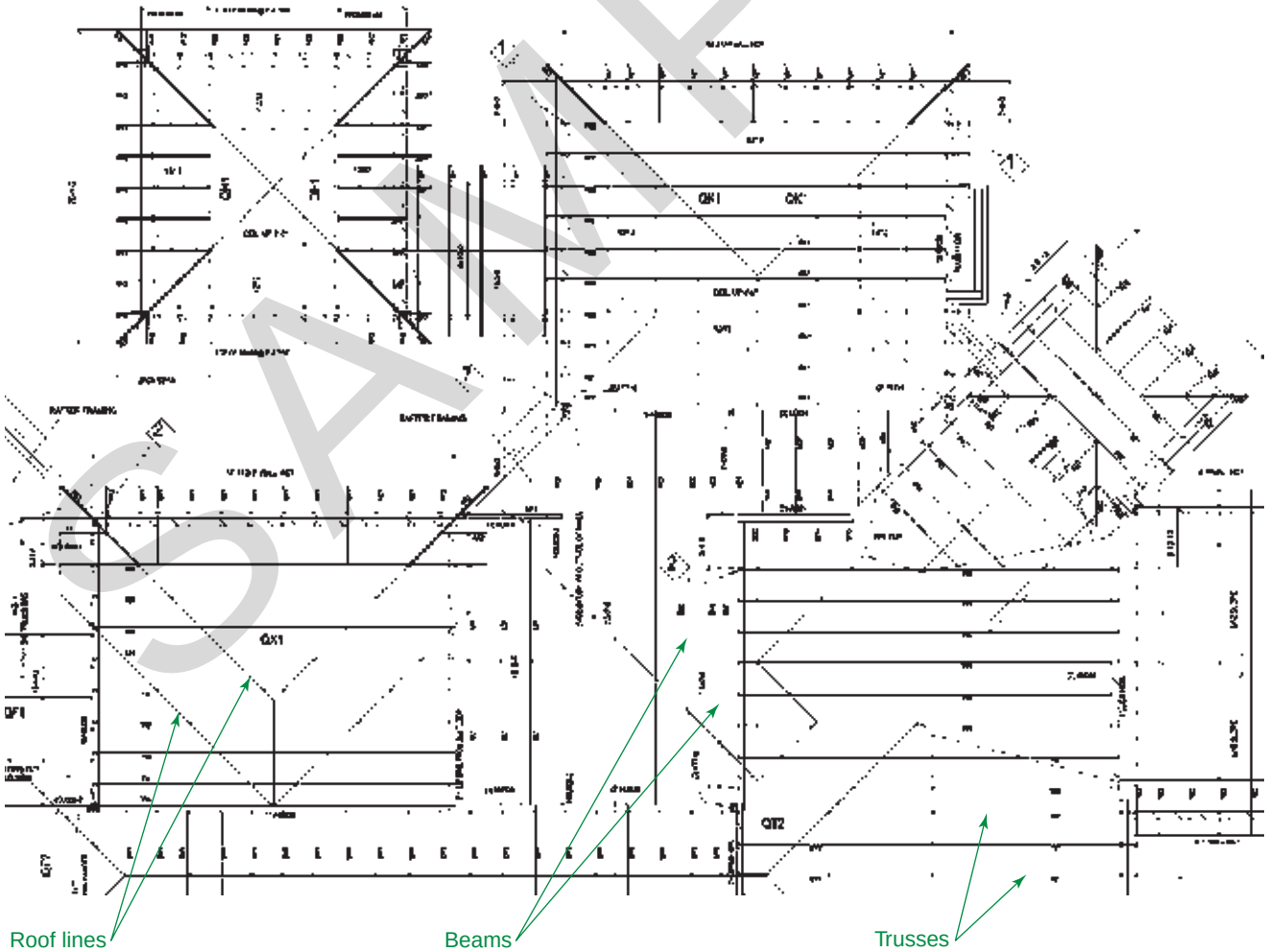

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Figure 12-18. A portion of a roof framing plan for a residence.

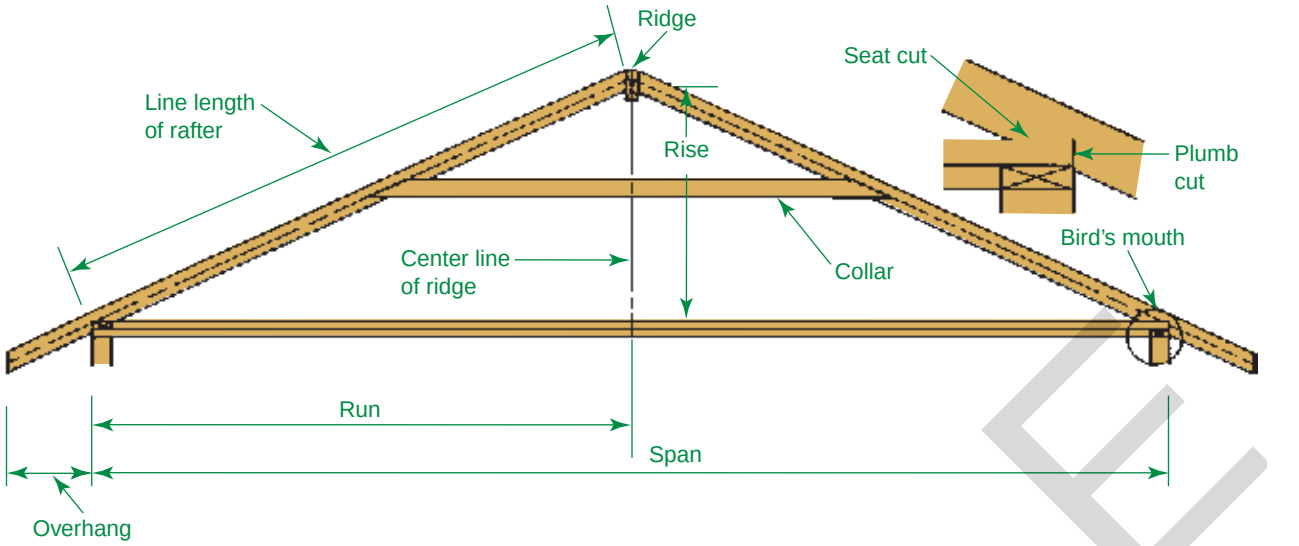

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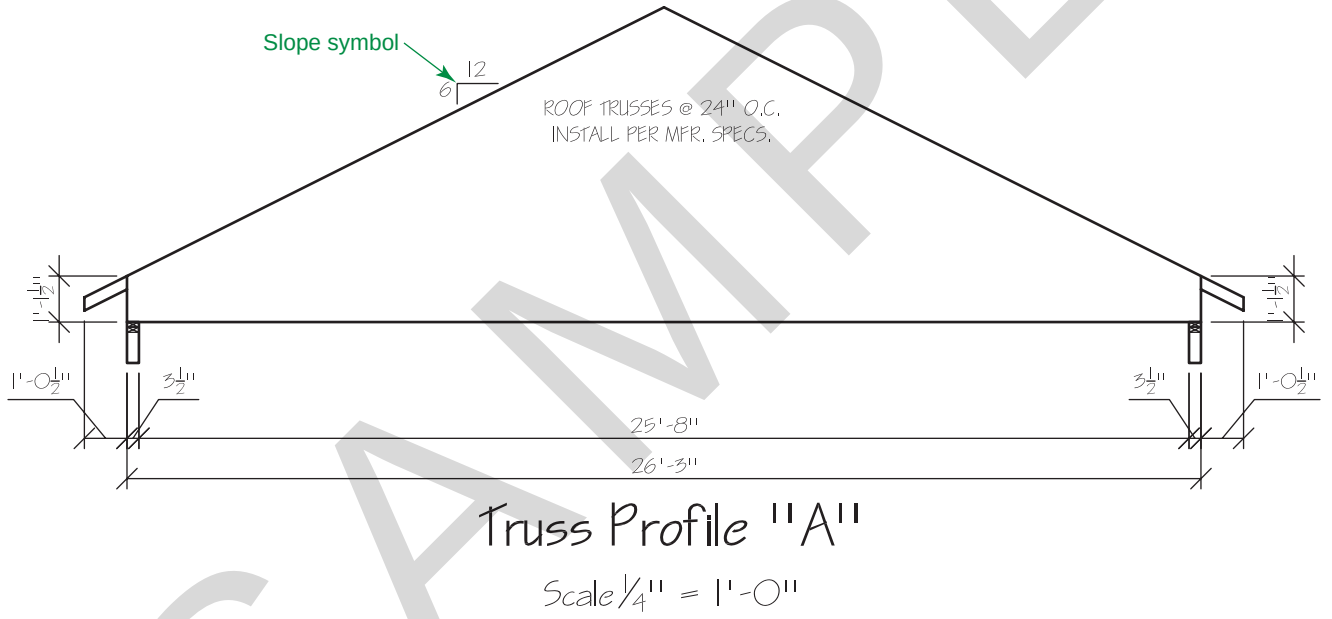
Figure 12-19. Common roof and truss framing terms.



Studer Residential Designs, Inc.

Figure 12-20. A detail drawing showing the dimensions of a roof truss and the roof slope.

- **Jack rafters**. Jack rafters have shorter spans and extend to either hip or valley rafters. ***Hip jacks*** extend from the top plate to a hip rafter. ***Valley jacks*** extend from a valley rafter to the ridge. ***Cripple jacks*** run between valley and hip rafters.

Another roof framing member is the ***purlin***, a horizontal member laid over truss rafters or under a series of rafters to support long rafters.

Stair Framing

To correctly install a staircase, some planning is needed. An elevation view of the stair layout is normally provided. There are several terms used to describe a stair system. See **Figure 12-22**.

- **Stringer**. The angled member running between the lower and upper floors that supports the stairs is the ***stringer***. A 2×8, 2×10, or 2×12 can be used for a stringer, depending on how wide and long the staircase is. The stringers are cut and installed while the wall and floor framing is completed.
- **Tread**. The ***tread*** is the horizontal member that forms the "step." The distance between either the front or the back of adjacent stairs is the tread width. The number of treads in the stairway and the width of each tread are given on the drawing.
- **Riser**. The ***riser*** is the vertical member that provides the change in elevation between two adjacent stairs. The number of risers and the

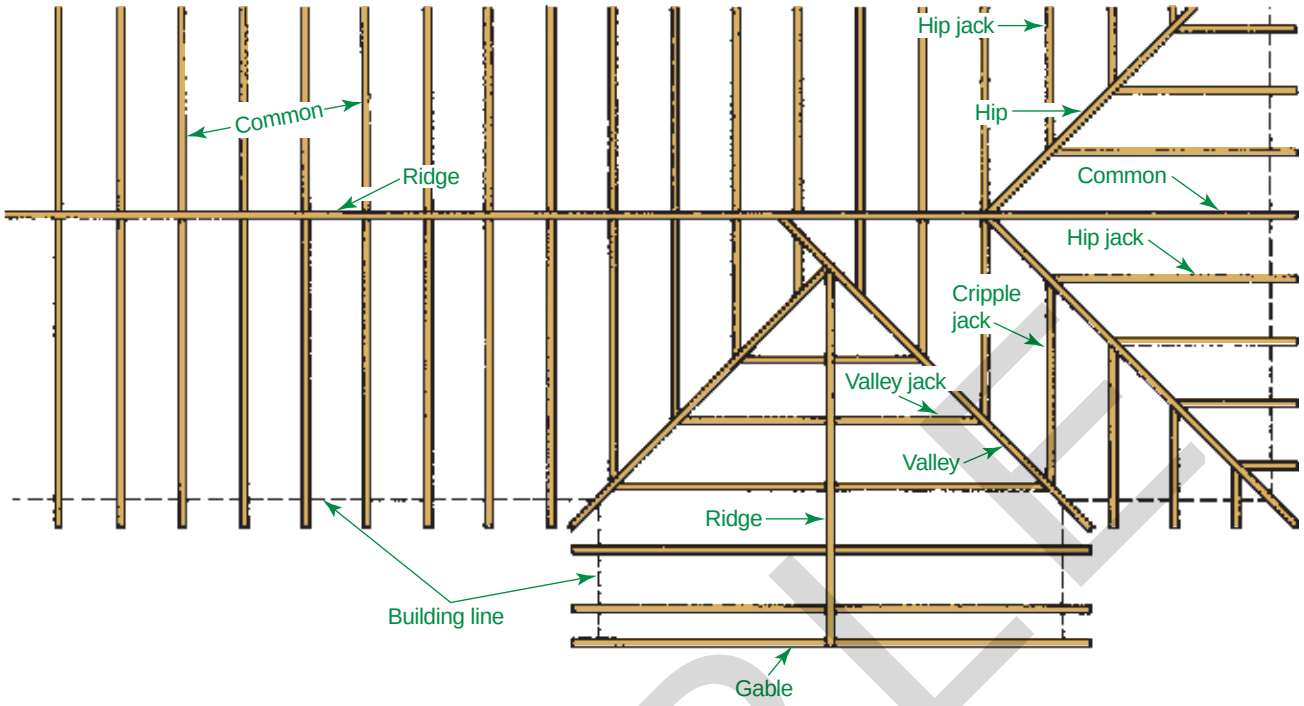


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Figure 12-21. Terms used to identify various kinds of rafters.

height of each are given on the drawing. There is always one more riser than the number of treads.

- **Run**. The total horizontal length of the stairway is the ***run***. The run should be the same as the number of treads multiplied by the tread width.
- **Rise**. If the riser height is multiplied by the number of risers, the vertical distance between floors is found. This distance is the ***rise***.

The set of stairs in **Figure 12-22** has 15 risers and 14 treads. The rise and run are calculated as follows if the riser height is 7″ and the tread width is 10 1/2″.

Rise = 15 risers × 7″ = 8′-9″
Run = 14 treads × 10 1/2″ = 12′-3″

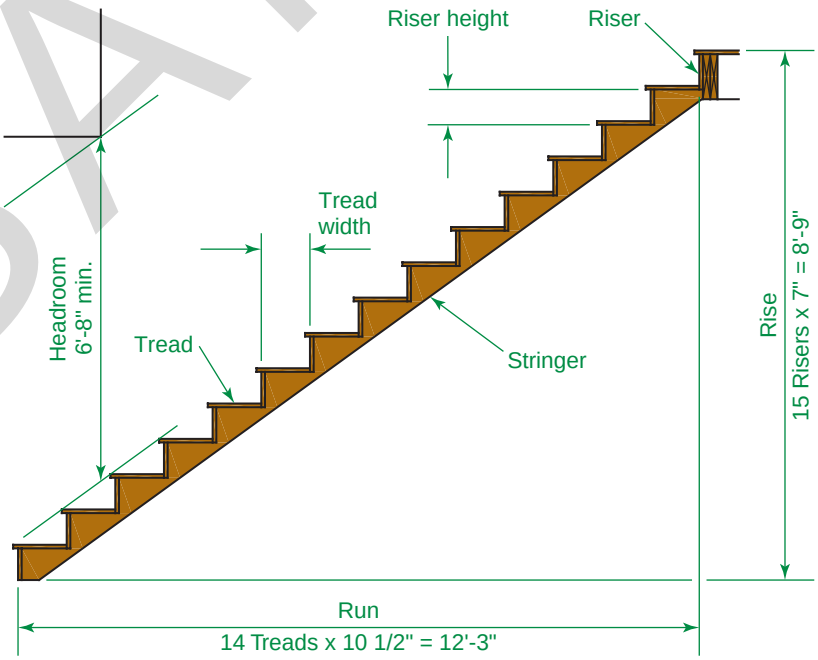

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Figure 12-22. Terms used to describe a stair system. The rise is the vertical distance between floors. The run is the total horizontal length of the stairway.

Stairs are designed and constructed in accordance with building codes. For residential construction, the International Residential Code (IRC) specifies a maximum height of 7 3/4″ for risers and a minimum width of 10″ for treads. In addition, the IRC specifies clearance requirements. A set of stairs must be at least 36″ wide, with a minimum headroom of 6′-8″ measured from the tread nosing to the ceiling above.

There are many stair arrangements, three of which are shown in **Figure 12-23**. A modification of the long "L" style features winders (pie-shaped treads) instead of a landing. Using ***winders*** conserves space. Also, there are circular winding stairs (called *spiral stairs*) that gradually change direction as they ascend or descend.

Rough treads are installed for use during construction. These are replaced when finish work is performed.

Metal Framing

Builders are using metal framing more often in both residential and commercial construction. Components are available for metal framing to meet all construction requirements, **Figure 12-24**. In addition to joists, wall studs, tracks, and blocking, many accessories are manufactured to provide for any need in metal framing, **Figure 12-25**. Buildings constructed with metal stud framing are designed by structural engineers.

Metal studs and joists are manufactured with punched holes in the web to accommodate plumbing and electrical installations. The holes in the web are provided 12″ from each end, with intermediate holes at intervals of 24″.

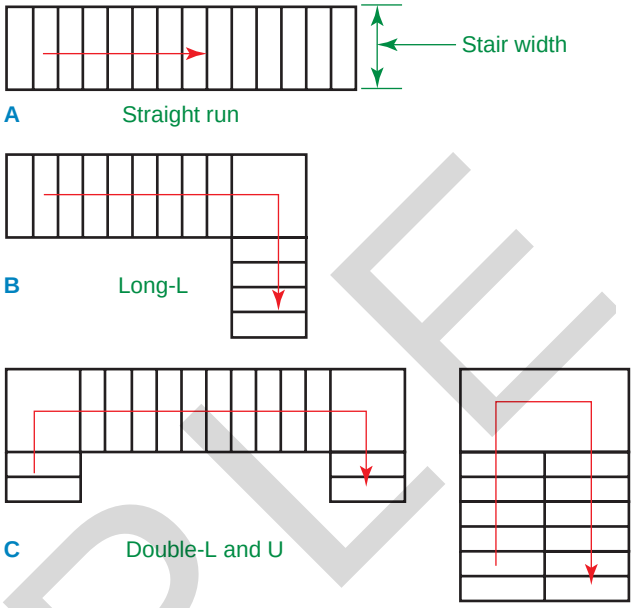

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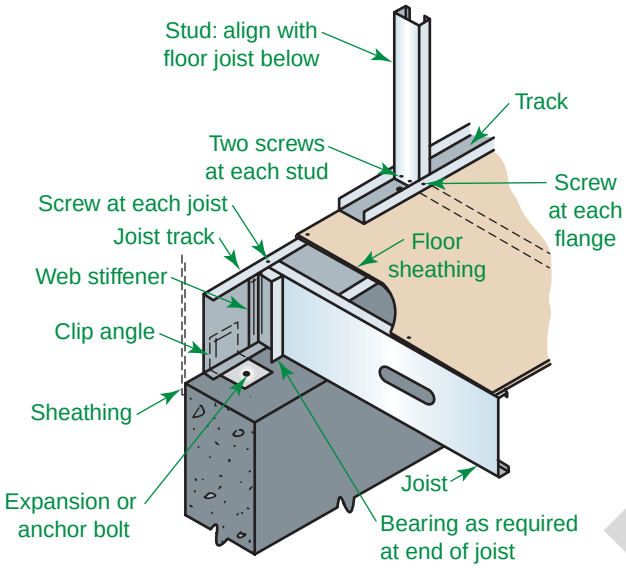
Figure 12-23. Three styles of stairs. A—Straight run stairs are the simplest to design and construct. B—Long-L stairs are used when a change of direction is needed or if the rise is large enough to require a landing. C—Either the double-L or U is used when the stair must turn 180°.

B Brown/Shutterstock.com

Figure 12-24. A variety of metal framing components is used in this commercial building project. Although residential use continues to grow, most metal framing today is used in commercial buildings.

Exterior/Interior Finish

The elevation drawings and wall sections show the exterior finish materials. The exterior finish includes the siding, cornice, roofing, exterior windows, and doors. See **Figure 12-26**. Also, dimensions of ceiling heights, roof pitch, and cornice details are given. Window units are designated with an "O" for a fixed section and an "X" for a sliding section. Interior finish information may be placed in a finish schedule.



Floor Framing

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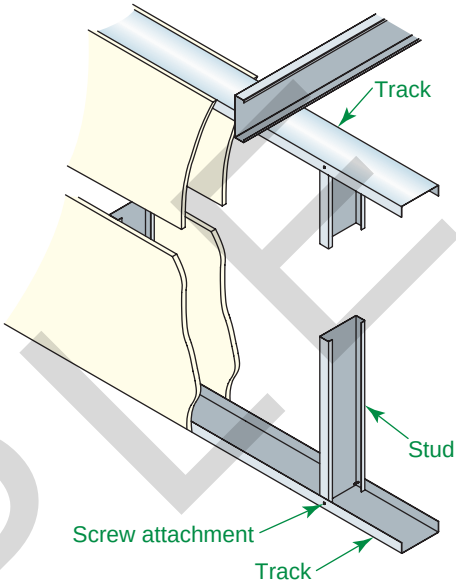

Interior Partition

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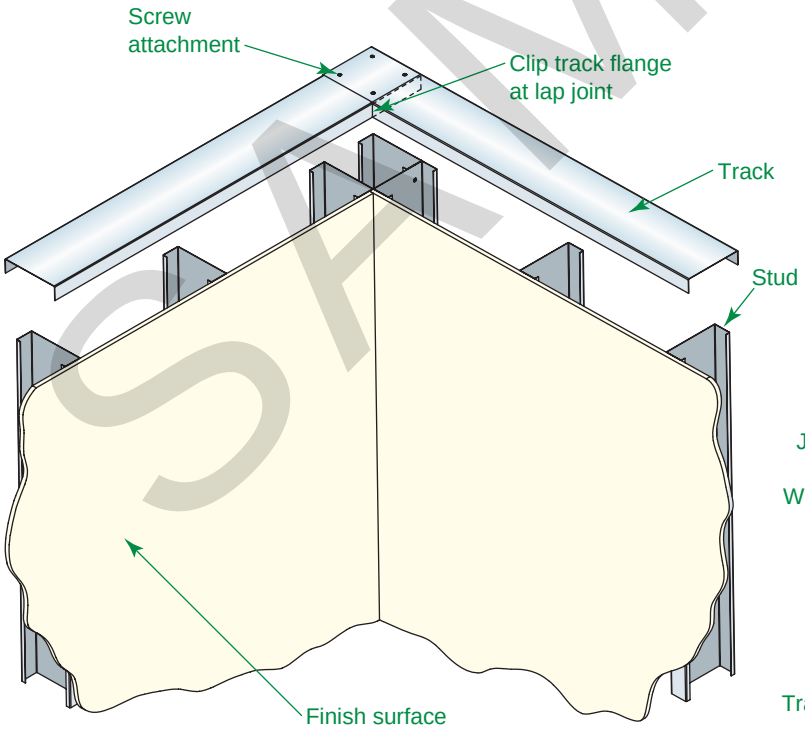
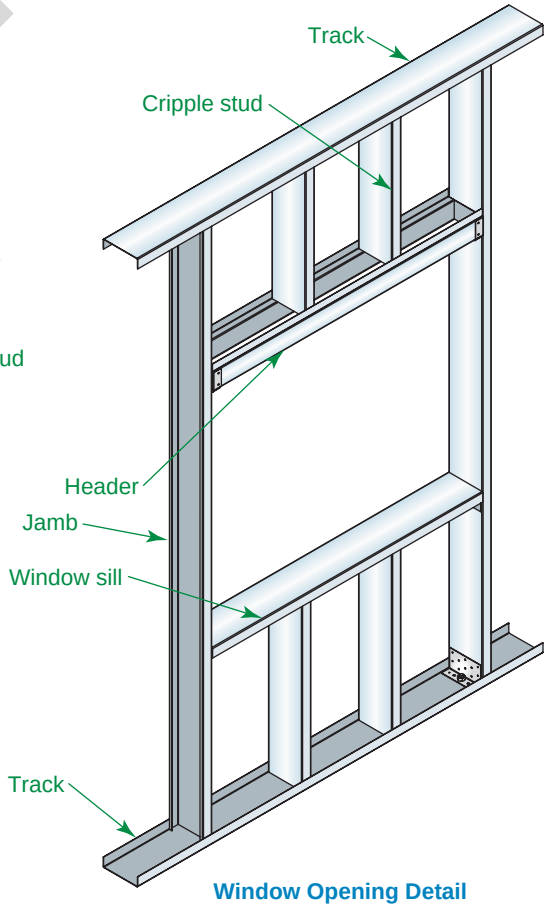


Wall Framing at Corner Track Lap Connection

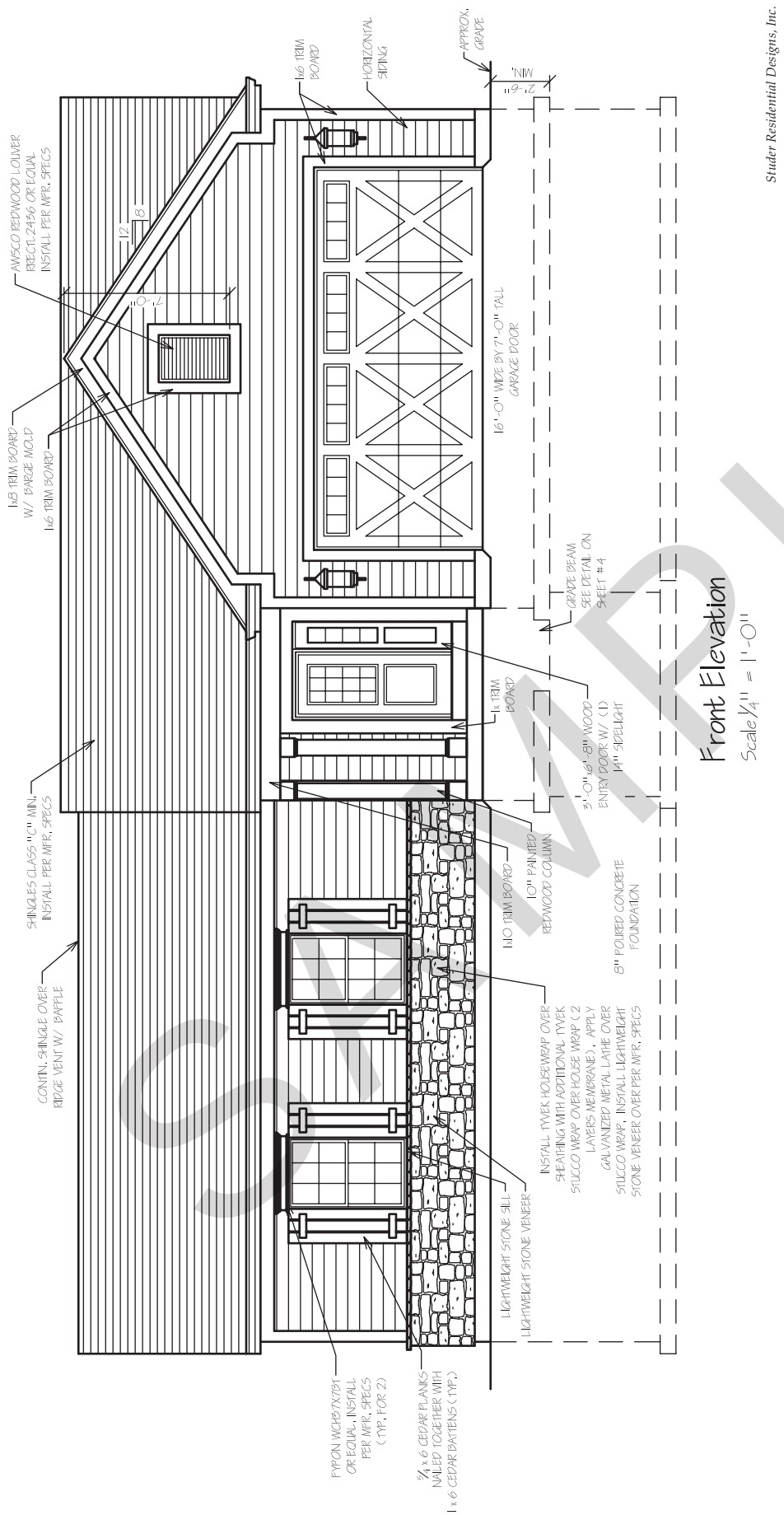
SCAFCO Corporation



Window Opening Detail

SCAFCO Corporation

Figure 12-25. Details for residential construction using metal framing.



Front Elevation
Scale 1/4" = 1'-0"

Studer Residential Designs, Inc.

Figure 12-26. The exterior siding and other exterior finish materials are specified on elevation drawings.

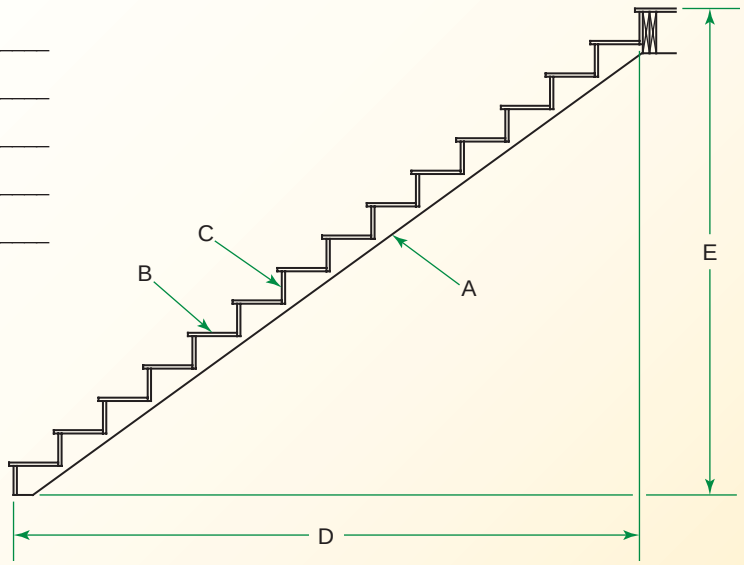
Test Your Knowledge

Name _____

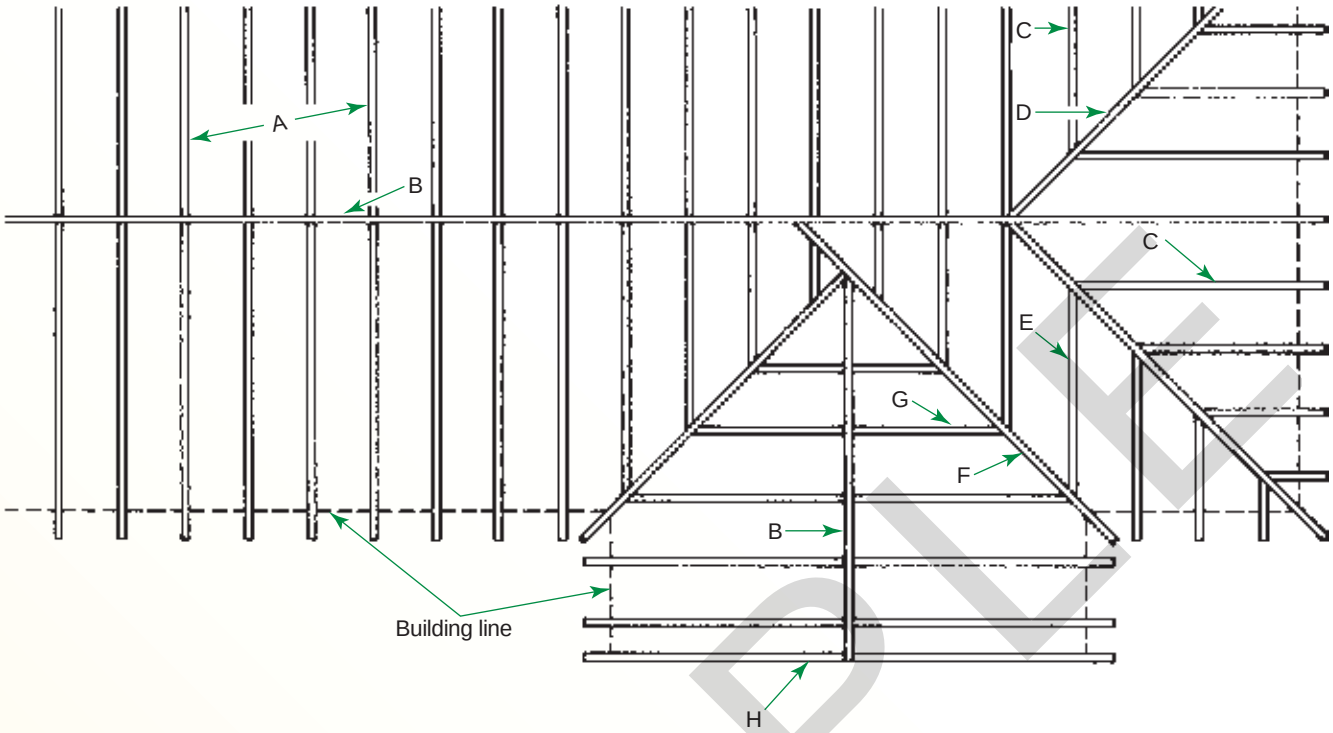
Write your answers in the spaces provided.

1. _____ Which of the following is *not* a reason for the use of wood in residential construction?
   A. It is readily available.
   B. It protects well against fire.
   C. It is relatively affordable.
   D. Dependable construction procedures have been established.
   E. All of these are reasons for the popularity of wood.
2. _____ Which member rests directly on top of the foundation wall?
   A. Header
   B. Joist
   C. Ledger
   D. Sill plate
   E. None of the above.
3. _____ Which member is located above a window?
   A. Rough sill
   B. Trimmer stud
   C. Header
   D. Ledger
   E. None of the above.
4. _____ Which member connects rafters to make the roof frame more stable?
   A. Collar beam
   B. Joist
   C. Hip rafter
   D. Valley rafter
   E. None of the above.
5. _____ A *winder* is a _____.
   A. member to which joists are attached
   B. flexible pipe
   C. stair handrail
   D. stair tread
   E. None of the above.
6. _____ *True or False?* A door schedule specifies the order in which doors are to be installed.
7. _____ *True or False?* A loadbearing partition is an interior wall that supports a load from above.
8. _____ *True or False?* Sectional views are normally drawn at a larger scale than plan views.
9. _____ *True or False?* Exterior wall dimensions are normally shown to the outside of a stud wall.
10. _____ *True or False?* In platform framing, wall studs run continuously from the sill plate to the roof.

11. Name the following parts of stair construction.
    A. _____
    B. _____
    C. _____
    D. _____
    E. _____



12. Name the following parts of the roof framing plan.



A. _____

B. _____

C. _____

D. _____

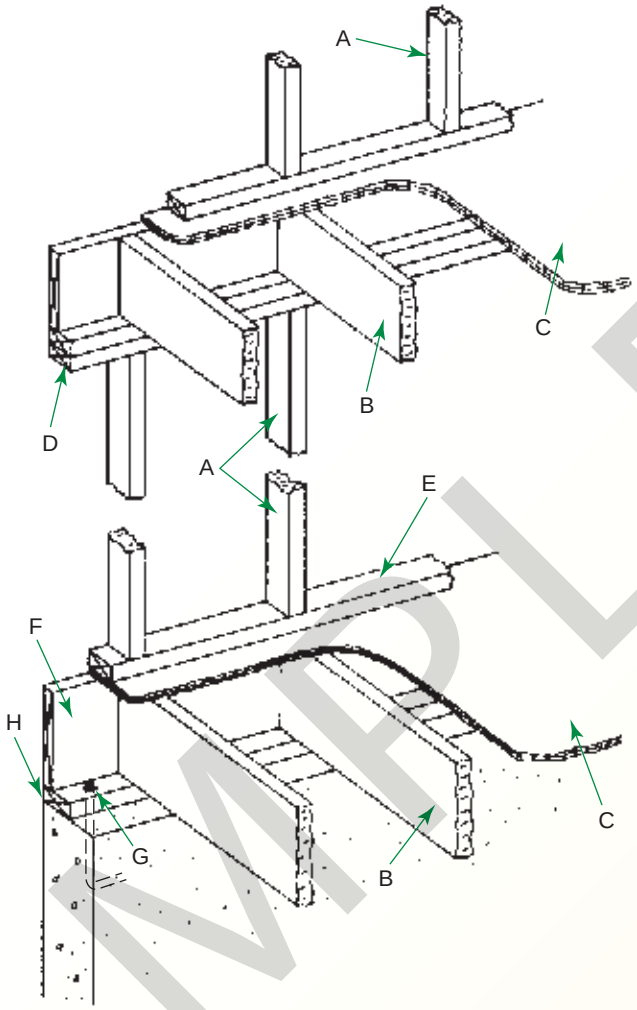
E. _____

F. _____

G. _____

H. _____

13. Name the following parts of the given framing system.



A. _____

B. _____

C. _____

D. _____

E. _____

F. _____

G. _____

H. _____

14. Referring to Question 13, what type of framing does the illustration represent?

_____

Activity 12-1

Framing Plans for a Residential Building Project

Name _____

Refer to Sheets 2, 4, and 5 from the Sullivan residential building plans in the Large Prints supplement to answer the following questions.

1. Where is the floor framing information for the first floor found?

   _____

2. What is the floor framing joist size and spacing?

   _____

3. What is the size of the steel beam supporting the floor joists?

   _____

4. How is the steel beam attached to the concrete foundation wall?

   _____

5. What kind of blocking is required along the perimeter of the exterior wall?

   _____

6. On which sheet is the steel beam detail noted?

   _____

7. How is the steel beam attached to the floor joists?

   _____

8. What is the roof slope over the following areas?

   A. Garage _____

   B. Main house _____

   C. Back porch _____

9. What is the overhang at the roof soffits?

   _____

10. What is the typical header requirement over openings on loadbearing partitions?

    _____

Activity 12-2

Framing Plans for a Residential Building Project

Name _____

Refer to Sheets 1, 2, and 3 from the Marseille residential building plans in the Large Prints supplement to answer the following questions.

1. What is the drawing scale for the following?
   A. Foundation Plan _____
   B. First Floor Plan _____
2. What is the size of the beam supporting the floor joists for the first floor?
   _____
3. What is the specification for the column resting on the 30″×30″ footing and supporting the beam?
   _____
4. What is the size and spacing of the floor joists for the first floor?
   _____
5. How is the steel column connected to the steel plate anchored to the 30″×30″ footing?
   _____
6. What are the specified wood types for the following framing members?
   A. 2×4 and 2×6 _____
   B. 2×8, 2×10, and 2×12 _____
7. What is the specified repetitive bending stress for 2×10 floor joists?
   _____
8. Draw the symbols that represent the following items. Sketch each symbol freehand in the space provided.
   A. Earth
   C. Brick
   B. Rough wood framing
   D. Finished wood

9. What is the live load for the first floor?

_____

10. What is to be used for the header above the garage door?

_____

11. What type of floor framing is required for the second-floor area?

_____

_____

12. Where on the first floor is the location of the loadbearing partition that carries the second-floor framing?

_____

13. What type of drywall is required in the garage?

_____

14. What are the ceiling heights in the following areas?

A. Great Room _____

B. Dining _____

C. Master Bedroom _____

15. What type of window is required to the right side of the front door?

_____

Activity 12-3

Framing Details and Elevation Drawings for a Residential Building Project

Name _____

Refer to Sheets 1, 3, 4, 5, and 6 from the Marseille residential building plans in the Large Prints supplement to answer the following questions.

1. What is the drawing scale for the following?
   A. Roof Plan _____
   B. Shear Wall Detail at Garage _____
2. What type of subfloor is specified over the floor joists?
   _____
3. What are the insulation requirements for the following areas of construction?
   A. 2×4 exterior walls _____
   B. Roof _____
   C. Basement _____
4. Refer to the roof truss detail for the roof truss over the garage.
   A. What profile is referenced? _____
   B. What spacing is used for roof trusses? _____
   C. What is the specified slope? _____
5. What is typically used to tie down the house framing to the foundation?
   _____
   _____
6. Referring to the stairs, what are the floor-to-floor heights and the number of risers for the following?
   A. Basement to first floor _____
   B. First to second floor _____

7. What is specified for the weather-resistant membrane under the lightweight stone veneer?

_____

_____

8. What is specified for the curved part of the roof over the upper-level middle windows?

_____

9. Describe what is required to brace the exterior walls.

_____

_____

_____

10. What is to be used for the typical header over windows and where is this information found?

_____