

Doors and Windows 15



Objectives

After studying this chapter, you will be able to:

- List the functions that doors and windows perform.
- Compare the types of doors used in a residential dwelling.
- Draw proper door and window symbols on a typical floor plan.
- Explain the information shown in a window or door detail.
- Prepare window and door schedules.

Key Terms

Accordion Door	Hopper Window
Awning Window	Horizontal Sliding Window
Basic Unit Size	Window
Bay Window	Jalousie Window
Bi-Fold Door	Mullions
Bow Window	Muntins
Box Bay	Overhead Sectional Door
Brick Mold	Panel Door
Casement Window	Picture Window
Casing	Picture Window
Circle Top Window	Pocket Door
Clerestory Window	Prehung Units
Combination Window	Rails
Door Jamb	Rough Opening
Door Schedule	Sash Opening
Double-Action Door	Sash
Double-Hung Window	Sill
Drip Cap	Skylight
Dutch Door	Sliding Doors
Flush Door	Special-Shape Window
French Doors	Stiles
Glass Size	Transom Bar
	Window Schedule

Doors and windows perform several functions in a residential structure. They shield an opening from the elements, add decoration, emphasize the overall design, provide light and ventilation, and expand visibility. Windows and doors are necessary features of all residential structures and should be planned carefully to ensure maximum contribution to the overall design and function of the structure.

Designing with CADD

Most of the larger window manufacturers—Andersen, Weather Shield, Pella/Rolscreen, Caradco, and Marvin—provide CADD packages that facilitate the drawing and specifying of their windows and doors, Figure 15-1. Be sure the package is compatible with your CADD software before you purchase it. Most manufacturers also provide window and door symbols for standard CADD packages. These symbols can be manipulated during the design process and then used to create a schedule of the windows and doors. In addition, several manufacturers have 3D symbols. These can be very useful when 3D illustrations are to be created, Figure 15-2.

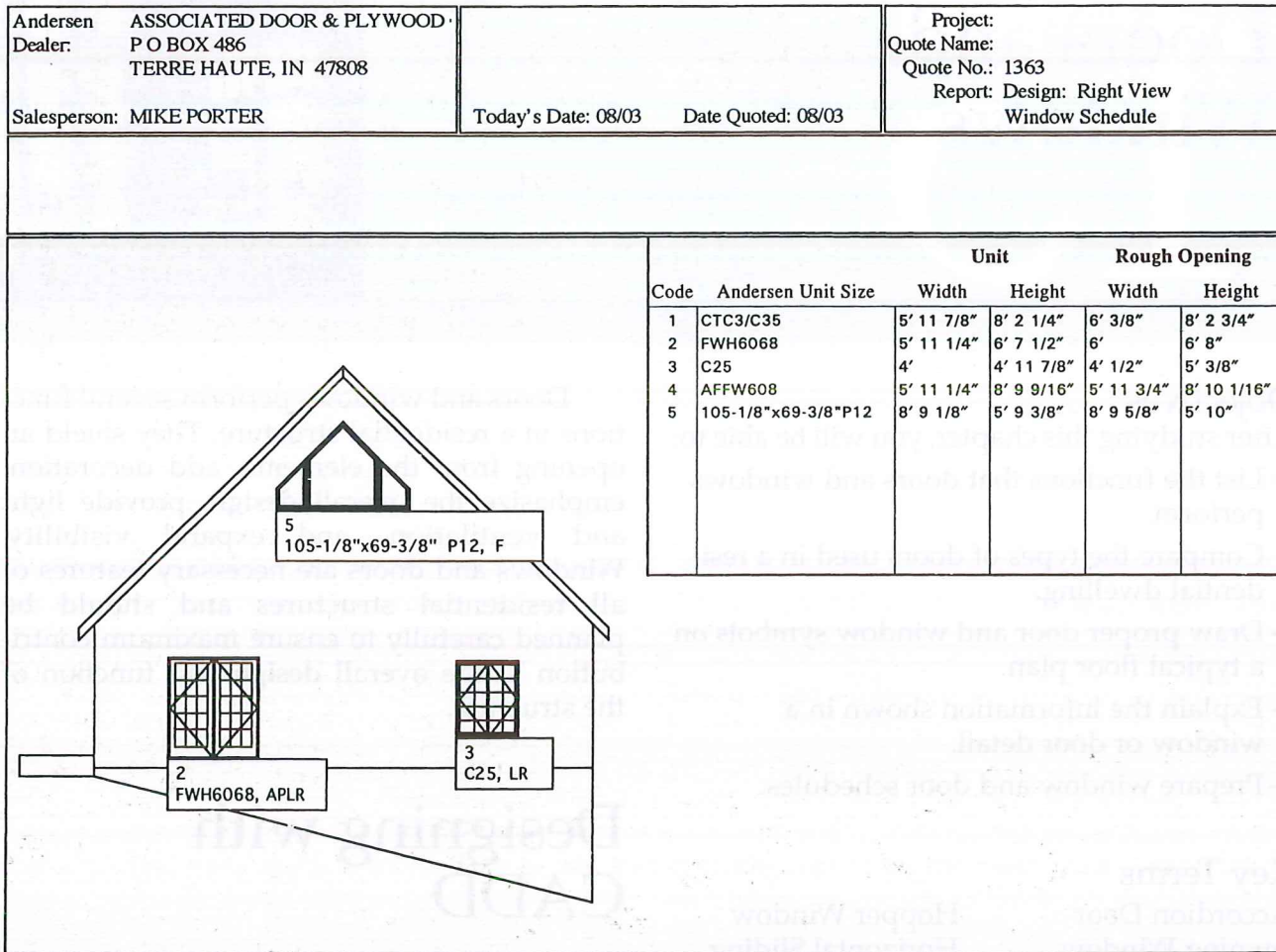


Figure 15-1. This printout is from Andersen's "Window of Knowledge System." Other reports include: quote, energy, performance, and graphics reports. (Andersen Corporation)

Interior and Exterior Doors

A number of classification systems may be used to identify the various styles and types of doors in residential construction. Two broad classes are interior and exterior doors. Doors may also be grouped according to the method of construction, uses, function, or location. Interior and exterior doors are typically 6'-8" high and available in various widths.

Interior Doors

There are several common types of interior doors. These types include flush, panel, bi-fold, sliding, pocket, double-action, accordion,

Dutch, and French. The next sections describe these types.

Interior doors should be a minimum of 32" wide to permit comfortable passage of a wheelchair. Lever-type or vertical pull-handles may be easier for a handicapped person to operate. Automatic door openers may be required in some cases.



Flush doors

Flush doors are smooth on both sides and usually made of wood, Figure 15-3. Standard interior wood flush doors are 1-3/8" thick. They are hollow-core doors that have a wood frame around the perimeter. Wood braces or a composition material is placed in the cavity to support the faces of the door. Interior flush doors are produced in a wide range of widths,



Figure 15-2. This beautiful CADD rendering shows all of the intricate details of the windows that add greatly to the realistic appearance of the drawing. (Helmuth A. Geiser, member AIBD)

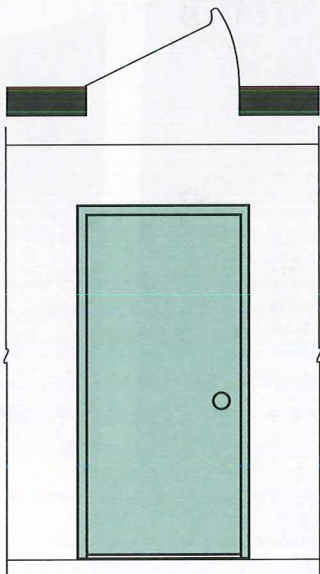


Figure 15-3. A flush door shown with its plan view symbol.

from 2'-0" to 3'-0". The standard width increment is 2". Both surfaces of the door are usually covered with 1/8" Masonite or plywood of mahogany or birch.

Panel doors

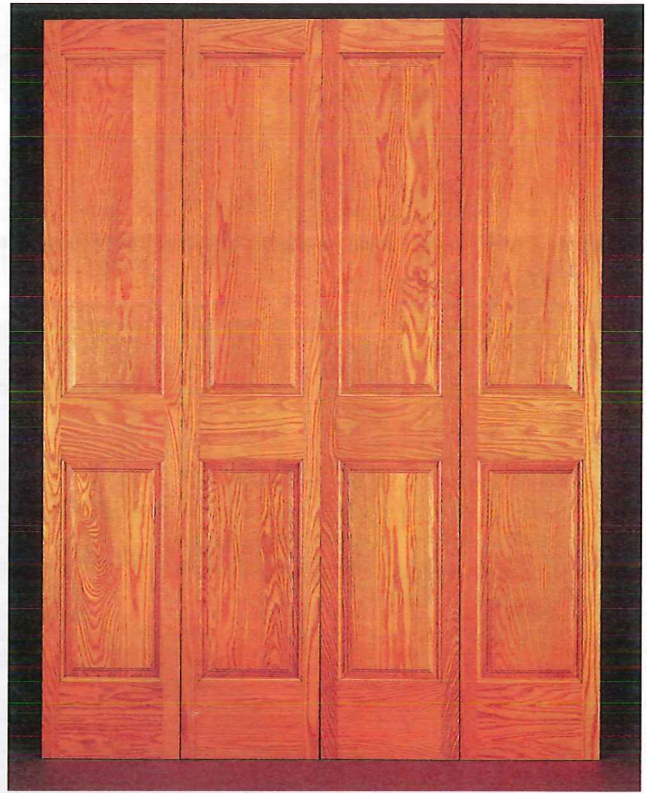
A *panel door* has a heavy frame around the outside and generally at least one cross member. The frame and cross members form small panels, Figure 15-4A. The vertical members are called *stiles* and the horizontal members are *rails*. Panels that are thinner than the frame are placed in grooves on the inside edges of the stiles and rails to enclose the space. The panels may be wood, glass, metal, or some other material. Panel doors are usually produced in white pine, but may be constructed of other woods or plastic. Figure 15-4B shows the plan view symbol and elevation view of a panel door.

Bi-fold doors

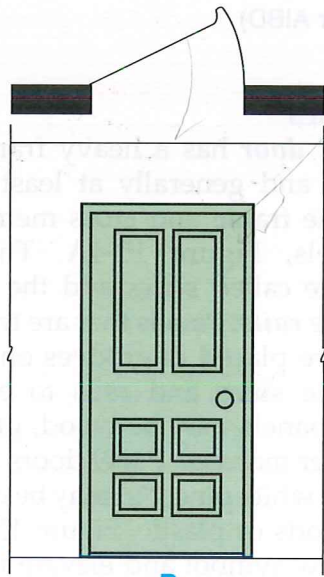
A *bi-fold door* is made of two parts that together form the door. They may be attached to the side jambs with conventional hinges or secured to the head jamb and floor using a pivot hinge. Bi-fold doors may be flush, paneled, or louvered, Figure 15-5. They are popular as closet doors, but are seldom used



A



A



B

Figure 15-4. A—This is a typical panel door used in residential construction. (Morgan Products, Ltd.)
B—A panel door shown with its plan view symbol.



B

Figure 15-5. Bi-fold doors come in many styles.
A—With panels. (Morgan Products, Ltd.)
B—Louvered.

for other applications. Bi-fold doors are installed in pairs with each door being the same width. Usual widths are 1'-0" to 2'-0". Wood, plastic, and metal bi-fold doors are produced in the standard 6'-8" height, as well as 8'-0". The usual thickness is 1-1/8" for wood or plastic and 1" for metal. See Figure 15-6 for the symbol and elevation view.

Sliding doors

Sliding doors, or bypass doors, are popular where there are large openings, Figure 15-7. They are frequently used as closet doors. Any number of doors may be used for a

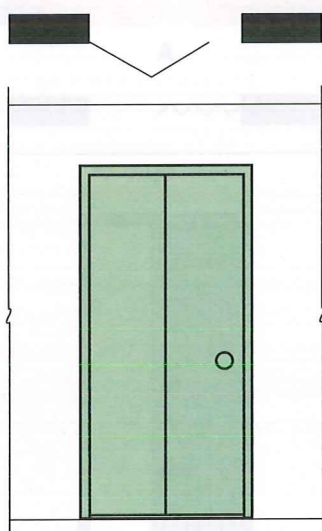


Figure 15-6. A bi-fold door shown with its plan view symbol.

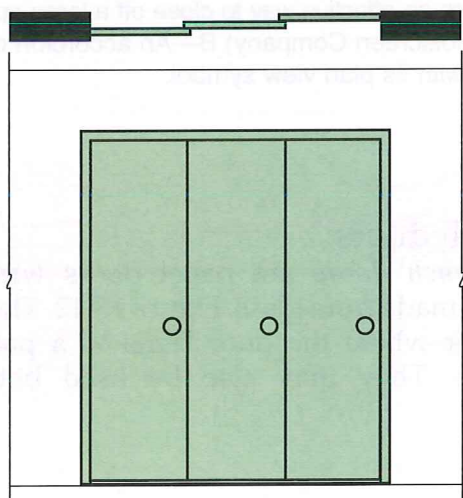


Figure 15-7. Three sliding doors shown with their plan view symbols.

given opening. The width is not critical because the doors are hung from a track mounted on the head jamb. Door pulls are recessed to allow the doors to pass without interference. Glides are installed on the floor to prevent the bottoms from swinging in or out.

Sliding doors may be flush, paneled, or louvered. They are usually constructed from wood, but other materials may be used. The major problem with wood sliding doors is warping since they are not restrained by hinges.

Pocket doors

Pocket doors are a variation of the sliding door and usually the flush style. A pocket door is hung from a track mounted on the head jamb. Ordinarily, only one door is used to close an opening. The door rests in a wall pocket when open, Figure 15-8.

Pocket doors are frequently used between rooms such as the kitchen and dining room. The chief advantage is that they require no space along the wall when open. However, they are difficult to operate and present problems if outlets or cabinets are to be located on the wall outside of the pocket cavity. Pocket door frames of metal and wood are usually purchased already assembled.

Double-action doors

Double-action doors are hinged in such a way that they can swing through an arc of

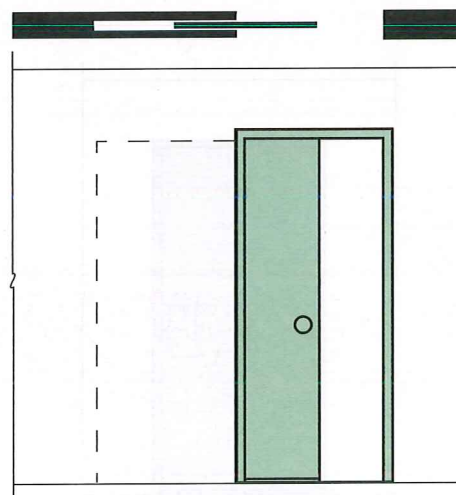


Figure 15-8. A pocket door shown with its plan view symbol.

180°, Figure 15-9. A special double-action, spring-loaded hinge is used and mounted in the center of the side jamb. This door is generally used between rooms that experience a great deal of traffic, yet require the door to be closed most of the time. Double-action doors may be single or double doors. A flush, panel, or louvered style can be used.

Accordion doors

Accordion doors are frequently used to close large openings where bi-fold or sliding doors are not acceptable, Figure 15-10A. They require little space and are produced in a large variety of materials and designs. They may be constructed from wood, plastics, or fabric. Individual hinged panels are sometimes used, as well as a large folded piece of fabric or other material. The door is supported on a track mounted on the head jamb, Figure 15-10B.

Dutch doors

A *Dutch door* is composed of two parts—an upper and lower section. The upper section may be opened independently of the lower section. This allows for light and ventilation, Figure 15-11. A Dutch door may be used between the kitchen and dining room or as an exterior door.

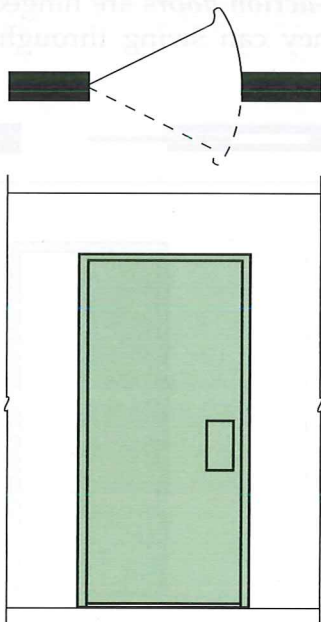


Figure 15-9. A double-action door shown with its plan view symbol.

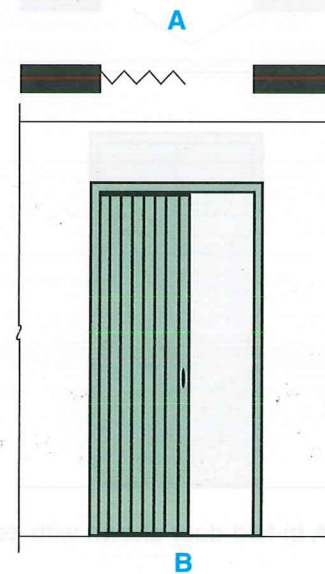


Figure 15-10. A—These beautiful, paneled accordion doors are an effective way to close off a large opening. (Pella/Rolscreen Company) B—An accordion door shown with its plan view symbol.

French doors

French doors are panel doors with the panels made from glass, Figure 15-12. They are popular where the door leads to a patio or terrace. They may also be used between rooms.

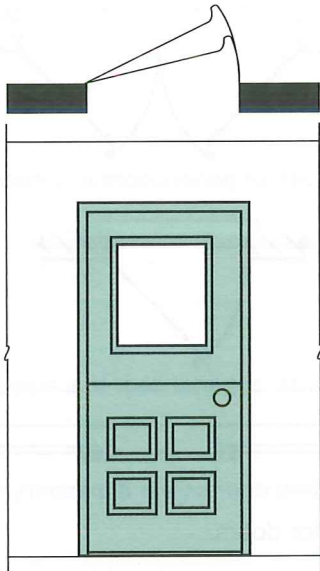


Figure 15-11. A Dutch door shown with its plan view symbol.

Exterior Doors

Residential exterior doors are similar to some of the interior types, but also have decided differences. Exterior wood doors are usually not hollow core as are many interior doors. They are also thicker than interior doors and may have one or more glass panels to provide visibility.

Common exterior door styles include flush, panel, and swinging or sliding glass. Garage doors are also exterior doors. Exterior doors, other than garage doors, are ordinarily 3'-0" wide. However, other widths are often available.

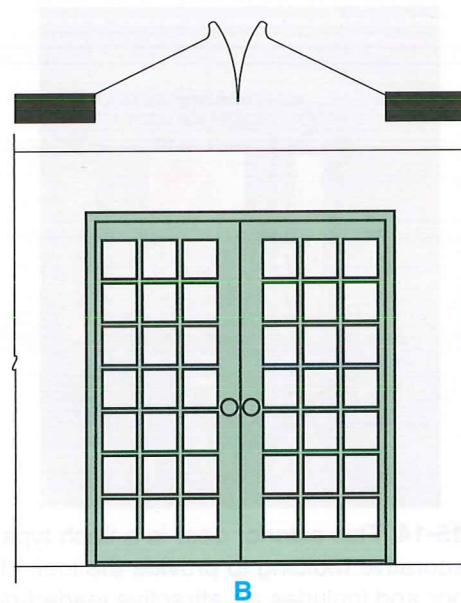
Figure 15-13 shows plan view symbols for various types of exterior doors. Compare these symbols to the interior door symbols shown earlier in this chapter.

Flush doors

The flush door is one of the most popular exterior doors. Standard exterior flush wood doors are usually 1-3/4" thick. These doors are produced from birch, mahogany, oak, and several other woods, as well as metal. Moldings or other decorative millwork may be added to the flush door to enhance its appearance, Figure 15-14.



A

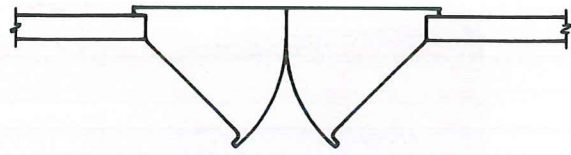


B

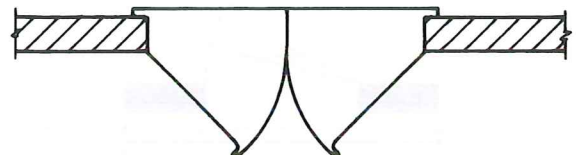
Figure 15-12. A—French doors are functional as well as decorative. When closed, they provide privacy for this sitting room. (Morgan Products, Ltd.) B—French doors shown with their plan view symbol.

Panel doors

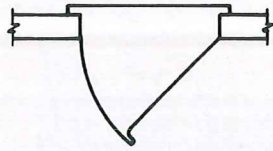
Exterior panel doors are available in a great variety of styles. They are constructed from white pine, oak, fir, and various other woods, as well as metal and plastics. These doors are produced in the same sizes as flush doors. Figure 15-15 shows a traditional panel door that is still popular today.



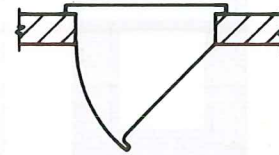
Double flush or panel doors in a frame wall



Double flush or panel doors in a masonry wall



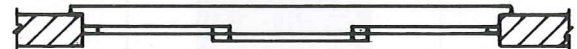
Single flush or panel door in a frame wall



Single flush or panel door in a masonry wall



Sliding door unit in a frame wall



Sliding door unit in a masonry wall

Figure 15-13. These are standard plan view symbols of common exterior doors.

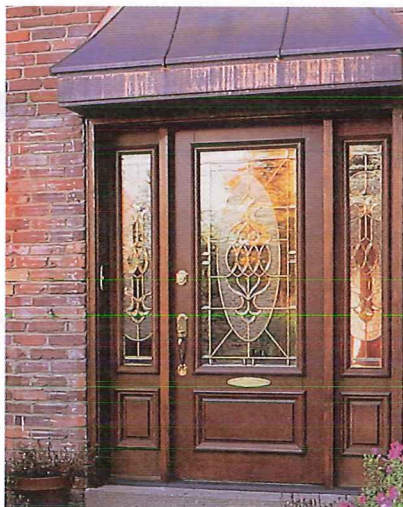


Figure 15-14. This exterior door is a flush type door. It has decorative molding to provide the look of a panel door and includes an attractive leaded-glass light. (Peachtree Doors, Inc.)

Sliding and swinging glass doors

In recent years, sliding and swinging glass doors have gained popularity, Figure 15-16. Sliding doors are usually made of wood and follow typical sliding glass door sizes. Metal units are also available. Figure 15-17 shows some of the standard sizes of exterior sliding glass doors that are available.

Garage Doors

The most popular type of garage doors is the *overhead sectional door*, Figure 15-18. Garage doors are available in wood, metal,

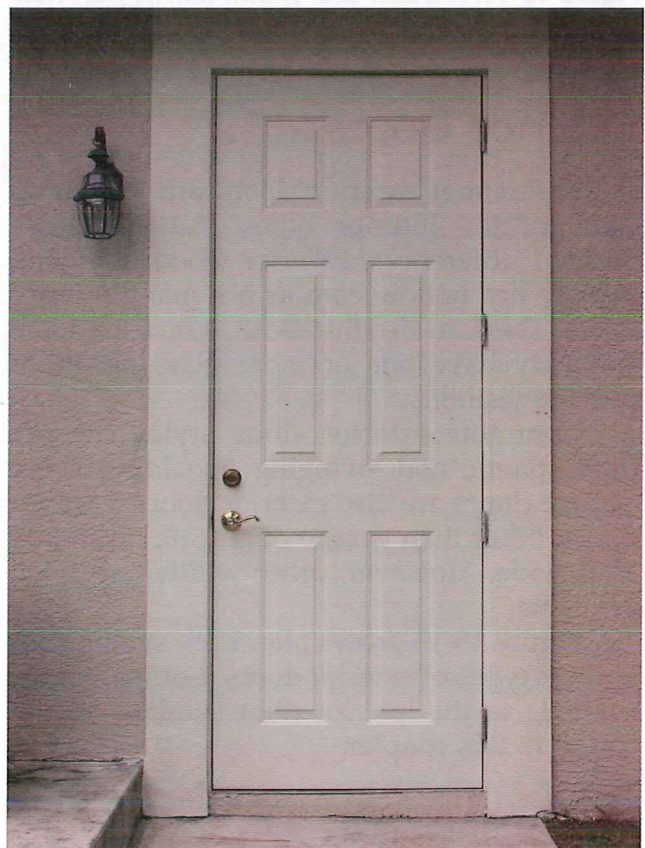
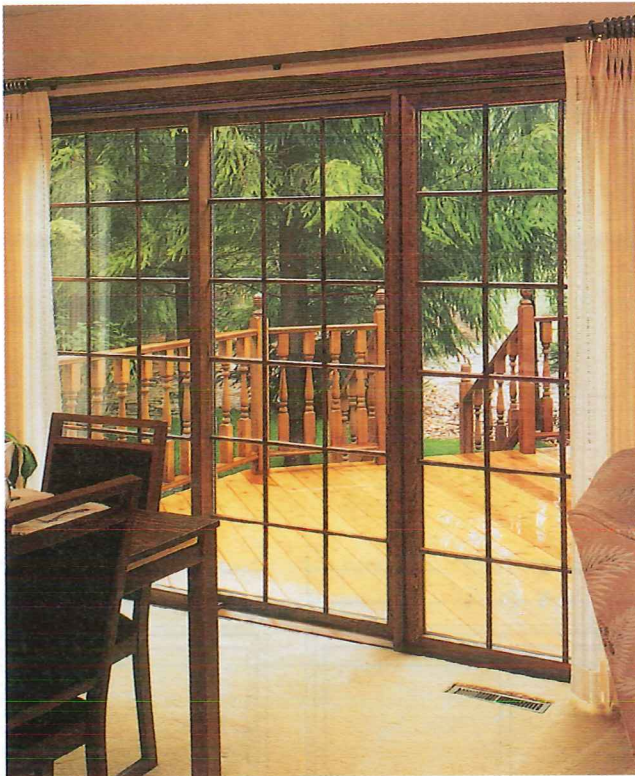


Figure 15-15. This traditional panel door is made of metal. This style of door is also available in wood.

and plastics. Each material has its advantages and personal choice is usually the determining factor in selection. The chart in Figure 15-19 shows standard garage door sizes.

If an automatic garage door opener is to be installed, proper space and wiring must be



A



B

Figure 15-16. A—These sliding glass doors provide a panoramic view and easy access to the deck. (Pella/Rolscreen Company) B—These swinging glass doors allow access to the deck and natural light into the dining room. (The Atrium Door and Window Corporation)

provided. Additional headroom is required above the open door to mount the motor drive on the ceiling. An electrical outlet is required to operate the opener. Check the manufacturer's installation requirements for the specific door.

Specifying Doors

Each door identified on the foundation/basement plan and floor plan should appear in a *door schedule* with its specifications. Information included on the door schedule should be obtained from manufacturers' literature. Specifications vary and it is important to have exact information for the schedule. A typical door schedule is shown in Figure 15-20. The door schedule should be placed on the sheet with the floor plan or elevations, if space permits. Otherwise, it should be located in the details section of the set of drawings.

Door Details

An interior or exterior door is placed inside a *door jamb*, which is the frame that fits inside the rough opening, Figure 15-21. Jambs may be constructed from wood or metal. Wood jambs are more common in residential construction. A jamb consists of three parts—two side jambs and a head jamb across the top. Jambs for exterior doors are ordinarily 1-1/8" thick while interior jambs are 3/4". The door stop is a rabbet joint in the thicker exterior jambs, but is applied to the face of interior jambs, Figure 15-22.

Jambs are available already assembled with the door hung and ready for installation. These are called *prehung units*. Prehung units are adjustable for slight variations in wall thickness. Consult the manufacturer's literature to determine the preferred rough opening size.

Rough openings for interior doors are usually framed 3" more than the door height

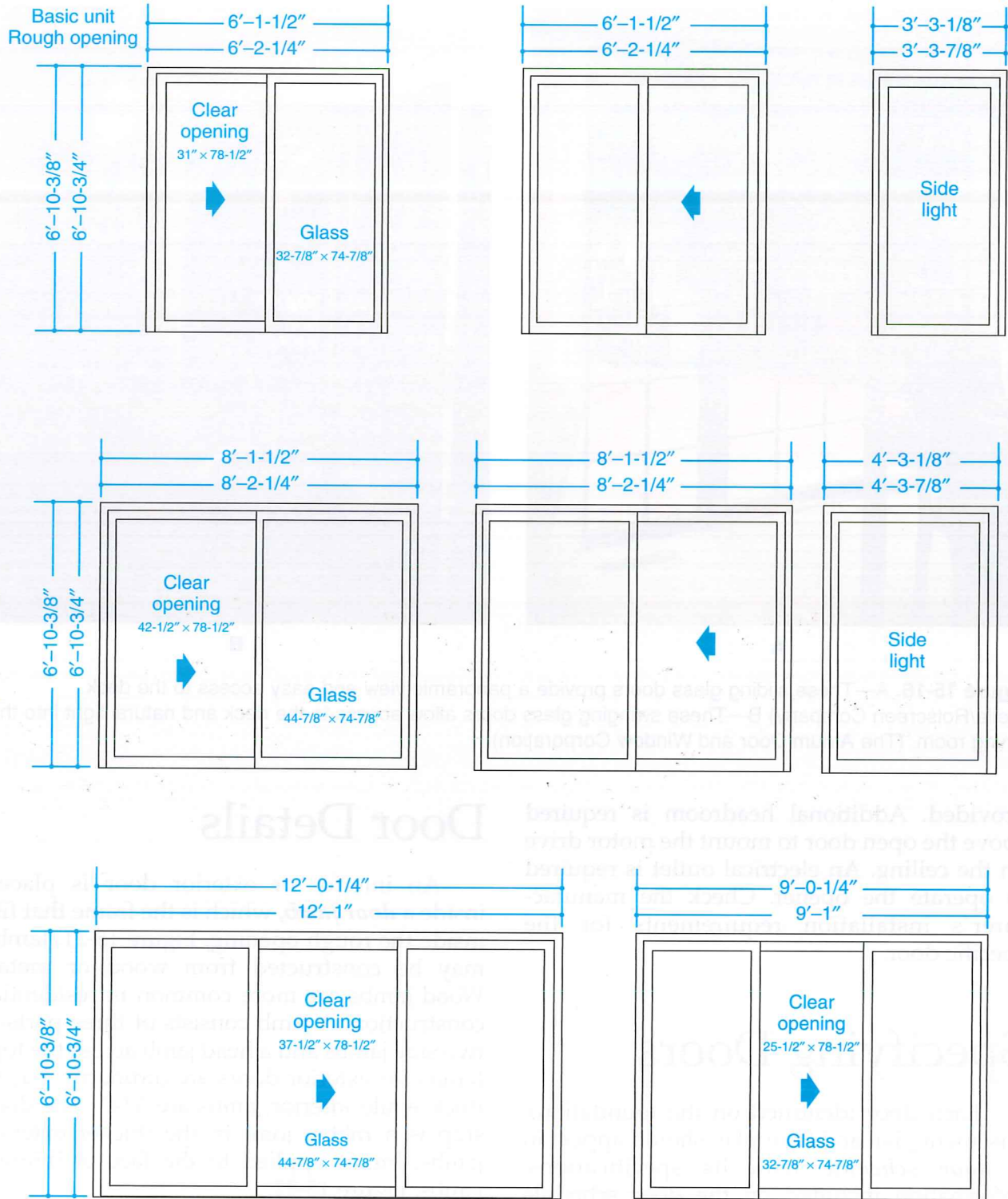


Figure 15-17. Standard sizes of glass sliding doors.

and 2-1/2" more than the door width. This provides ample space for the jambs and the necessary leveling and squaring. The space between the jamb and rough framing is covered with trim called *casing*. Exterior casing is usually thicker than interior casing. When

installed in a masonry wall, casing is called *brick mold*. In frame construction, a *drip cap* is used over the top piece of trim to shed water. Such a strip is not necessary in masonry construction.



Figure 15-18. This overhead sectional garage door is made of steel.

Garage door sizes		
Height	Single door width	Double door width
6'-6"	8'-0"	15'-0"
6'-6"	9'-0"	16'-0"
6'-6"	10'-0"	18'-0"
7'-0"	8'-0"*	15'-0"
7'-0"	9'-0"	16'-0"*
7'-0"	10'-0"	18'-0"
8'-0"	8'-0"	—

*These sizes are the most frequently used.

Figure 15-19. This chart shows common garage door sizes.

Exterior doors require a sill at the bottom of the door opening between the two side jambs. A *sill* is designed to drain water away from the door and provide support for the side jambs. Sills are constructed from wood, metal, concrete, and stone. Figure 15-23 shows a typical exterior flush door detail in frame and

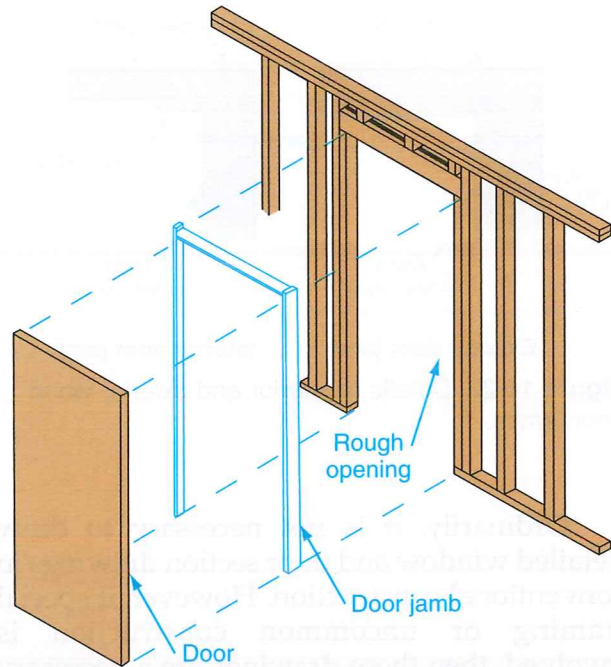


Figure 15-21. The door jamb fits inside the rough opening and supports the door.

brick veneer construction. Door and window construction details are usually drawn in section through the head jamb, the side jamb, and the sill. The head jamb is the jamb across the top of the opening.

Construction details for exterior sliding door units are slightly more complicated than other doors, Figure 15-24. Exterior sliding door jambs vary from one manufacturer to another. The number of door units may also affect the size and shape of the jambs. When specifying exterior sliding doors, it is advisable to secure specifications from the manufacturers to ensure accuracy.

Door schedule						
Sym.	Quan.	Type	Rough opening	Door size	Manufacturer's number	Remarks
A	2	Flush	3'-2-1/2" × 6'-9-1/4"	3'-0" × 6'-8"	EF 36 B	1-3/4" Solid core, birch
B	6	Flush	2'-10-1/2" × 6'-9-1/4"	2'-8" × 6'-8"	IF 32 M	1-3/8" Hollow core, mahogany
C	2	Flush	2'-8-1/2" × 6'-9-1/4"	2'-6" × 6'-8"	IF 30 M	1-3/8" Hollow core, mahogany
D	8	Bi-fold	See manufacturer's specs.	6'-0" × 6'-8"	BF 36 AL	Two units each 36" wide, aluminum
E	2	Sliding	4'-2-1/2" × 6'-9-1/4"	4'-0" × 6'-8"	IF 24 M	1-1/8" Hollow core, mahogany
F	1	Garage	See manufacturer's specs.	16'-0" × 7'-0"	G 16 S	Two light overhead sectional, alum.

Figure 15-20. A typical door schedule for a set of residential house plans.

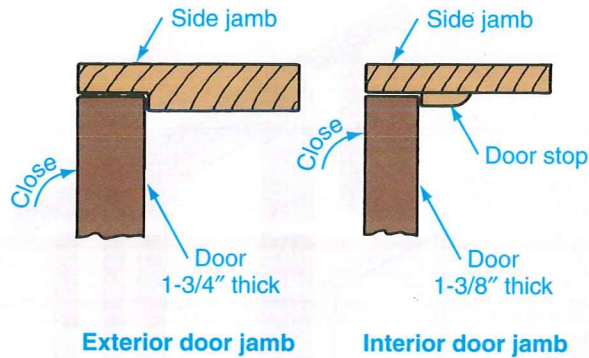


Figure 15-22. Details of interior and exterior wood door jambs.

Ordinarily, it is not necessary to draw detailed window and door section drawings in conventional construction. However, if special framing or uncommon construction is involved, then these drawings are a necessary part of a set of construction drawings.

Windows

When selecting windows for a dwelling, it is important to remember the functions that windows perform. They admit light from the outside; provide fresh air and ventilation to the various rooms; help to create an atmosphere inside by framing an exterior view; and

add detail, balance, and design to the exterior of the house.

A uniform amount of light across a room is desirable. Proper design and placement of windows will help to eliminate dark corners and extremely bright areas. The following guidelines will help achieve a more evenly lighted room.

- Glass area should be at least 20% of the floor area of the room. This amount of glass will provide suitable natural light even on cloudy days. When the light outside is very bright, the intensity may be controlled with shades or draperies.
- For increased light, face the principle windows toward the south.
- One large window opening will produce less contrast in brightness than several smaller openings.
- Better distribution of light will be accomplished if windows are placed on more than one wall.
- Windows placed high on a wall will provide a greater degree of light penetration into the room than windows placed low.
- Select the window shape that gives the type of light distribution desired in the room. Tall, narrow windows tend to give a thin and deep penetration. Short, wide windows produce a shallow penetration over a broad area.

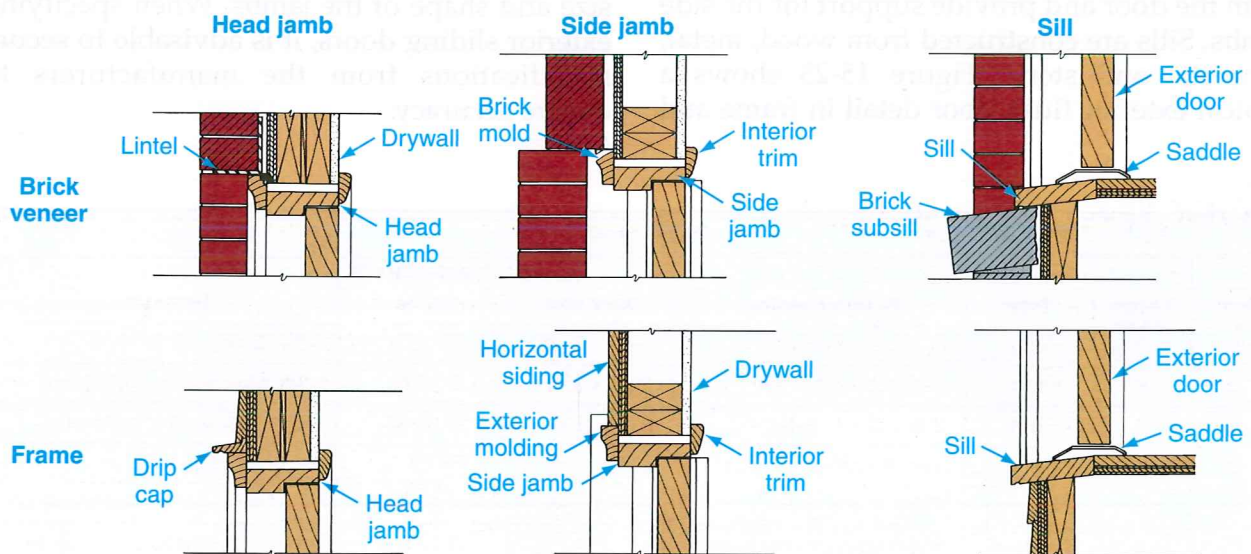


Figure 15-23. Exterior door details for frame and brick veneer construction.

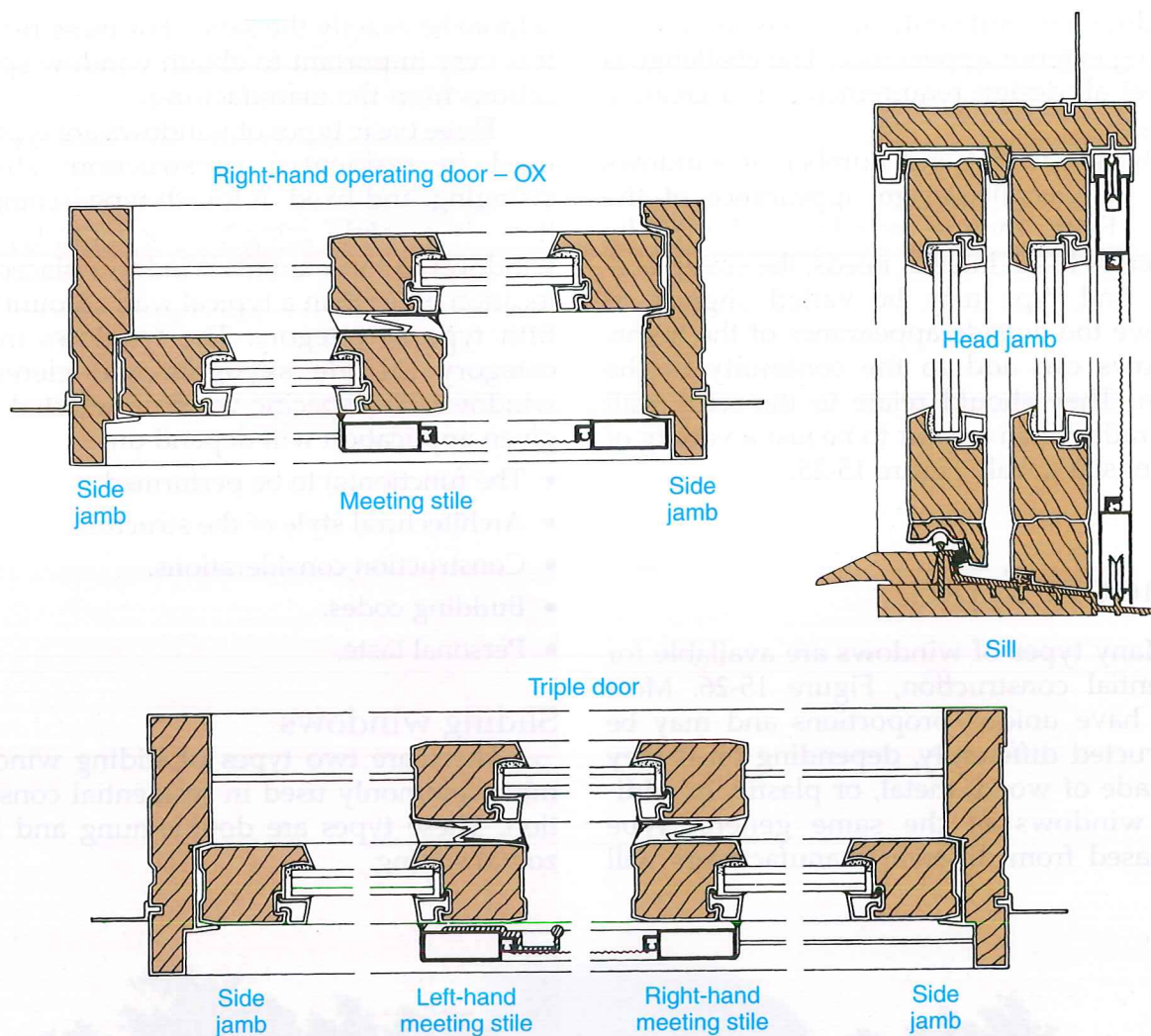


Figure 15-24. Details for sliding glass doors are more complex than for other doors.

Natural ventilation in a home is necessary all year long, but is especially important during the summer months. If windows are located with adequate ventilation in mind, comfort will be increased considerably. Apply these guidelines for efficient ventilation.

- Openings for ventilation should be at least 10% of the floor area.
- Placement of openings for ventilation should take advantage of prevailing breezes.
- Locate windows in such a way to achieve the best movement of air across the room. Furniture should be placed so it will not interfere with the flow of air through the room.

Windows may often be used to enhance an existing view or provide a selective one. Large areas of glass tend to make a room look larger.

The size and shape of the windows will frame the view, so it is important to select a window of the proper proportions... one that does not have obstructions to the view. The following points will aid the designer in specifying the proper window for a particular view.

- A large area of fixed glass provides clear viewing without obstructions.
- Horizontal and vertical divisions in the window or between windows should be thin to minimize obstruction.
- The sill height of windows should be determined on the basis of furniture, room arrangement, and view.

Designing a home to be functional, efficient, and pleasing to the eye on the exterior is no small task. Some of the guidelines provided may conflict. A home that has been designed

for light, view, and ventilation may not have a pleasing exterior appearance. The challenge is to meet all design requirements in a creative manner.

The placement and number of windows affect the overall design appearance of the home. Even though windows should be selected to fulfill interior needs, the size, placement, and type may be varied slightly to improve the outside appearance of the home. Windows can add to the continuity of the design. They should relate to the solid wall areas rather than appear to be just a variety of openings in a wall, Figure 15-25.

Window Types

Many types of windows are available for residential construction, Figure 15-26. Most types have unique proportions and may be constructed differently, depending on if they are made of wood, metal, or plastic. In addition, windows of the same general type purchased from different manufacturers will

seldom be exactly the same. For these reasons, it is very important to obtain window specifications from the manufacturer.

Three basic types of windows are typically used in residential construction: sliding, swinging, and fixed. A fourth type—combination—is possible using two or more types of windows to form a unit. Windows placed in a location other than a typical wall account for a fifth type or category. The windows in this category include skylights and clerestory windows. The specific window selected for a given application will depend on:

- The function(s) to be performed.
- Architectural style of the structure.
- Construction considerations.
- Building codes.
- Personal taste.

Sliding windows

There are two types of sliding windows most commonly used in residential construction. These types are double-hung and horizontal sliding.

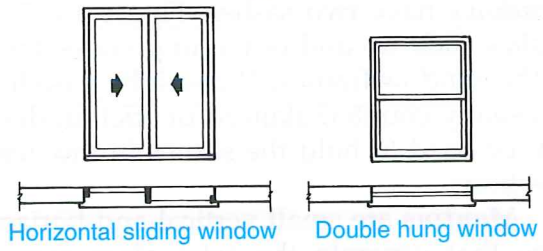


Figure 15-25. The windows of this attractive home complement the basic wall areas and add to the overall design balance. (Sater Design Collection, Inc.)



A

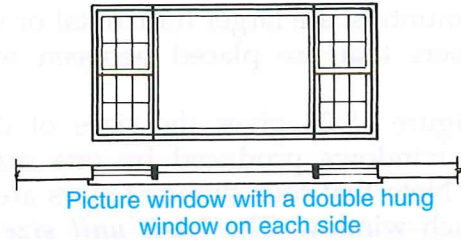
Sliding windows



Horizontal sliding window

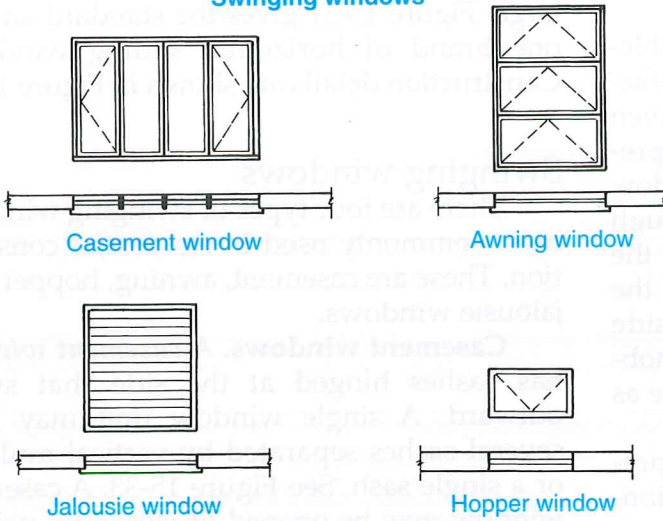
Double hung window

Combination windows



Picture window with a double hung window on each side

Swinging windows

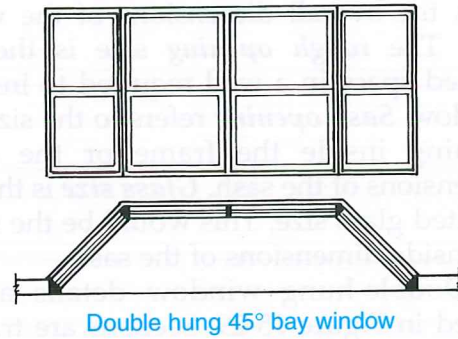


Casement window

Awning window

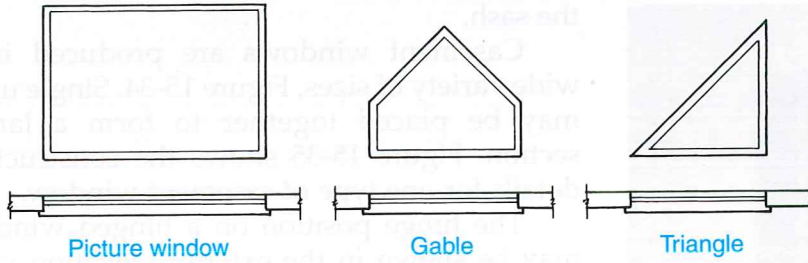
Jalousie window

Hopper window



Double hung 45° bay window

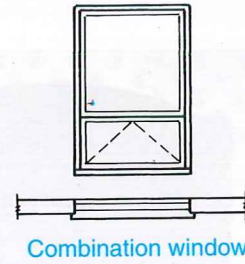
Stationary windows



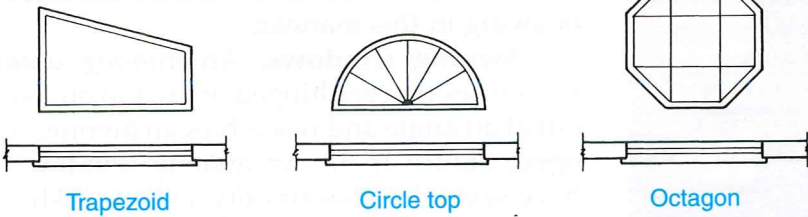
Picture window

Gable

Triangle



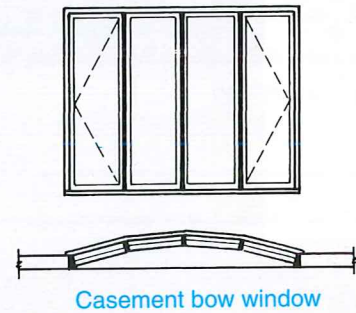
Combination window



Trapezoid

Circle top

Octagon



Casement bow window

B

Figure 15-26. A—Typical windows used in residential construction. (Caradco) B—Exterior and plan views of residential windows.

Double-hung windows. *Double-hung windows* have two sashes, Figure 15-27. The *sashes* slide up and down in grooves formed in the window frames. The weight of each sash is usually counterbalanced or friction devices can be used to hold the sashes in the desired positions.

Muntins are small vertical and horizontal bars that separate the total glass area into smaller units. *Mullions*, not to be confused with muntins, are larger horizontal or vertical members that are placed between window units.

Figure 15-28 gives the sizes of double-hung windows produced by one manufacturer. Note that four different sizes are given for each window. The *basic unit size* represents the overall dimensions of the window unit. The *rough opening* size is the rough framed space in a wall required to install the window. *Sash opening* refers to the size of the opening inside the frame or the outside dimensions of the sash. *Glass size* is the unobstructed glass size. This would be the same as the inside dimensions of the sash.

Double-hung window details are presented in Figure 15-29. Sections are tradition-



Figure 15-27. This is a double-hung window styled to be reminiscent of the Victorian era. (Weather Shield Mfg., Inc.)

ally drawn at the head jamb, side jamb, and sill, in a similar fashion as drawing doors. When a number of windows are placed together to form a unit it is often necessary to draw a section of the support mullion also.

Horizontal sliding or glider windows. *Horizontal sliding windows* ordinarily have two sashes, Figure 15-30. In some models both sashes are movable; in others, one sash is fixed. A track attached to the head jamb and sill provides for movement. Rollers are usually not required for windows unless they are quite large. Figure 15-31 gives the standard sizes of one brand of horizontal sliding windows. Construction details are shown in Figure 15-32.

Swinging windows

There are four types of swinging windows most commonly used in residential construction. These are casement, awning, hopper, and jalousie windows.

Casement windows. A *casement window* has sashes hinged at the side that swing outward. A single window unit may have several sashes separated by vertical mullions or a single sash. See Figure 15-33. A casement window may be opened or closed by using a crank, a push-bar on the frame, or a handle on the sash.

Casement windows are produced in a wide variety of sizes, Figure 15-34. Single units may be placed together to form a larger section. Figure 15-35 shows the construction details for one type of casement window.

The hinge position on a hinged window may be shown in the exterior elevation view by using a dashed line, as shown in Figure 15-36. It is usually advisable to indicate the direction of swing in this manner.

Awning windows. An *awning window* has sashes that are hinged at the top and swing out at an angle and resembles an awning when open, Figure 15-37. An awning window may have several sashes or only a single sash.

Crank-operated awning windows are manufactured in a wide variety of sizes. Figure 15-38 shows some of the standard sizes offered by one company. The head jamb, side jambs, sill, and transom bar details for a crank-type awning window are shown in Figure 15-39. The *transom bar* is a horizontal divider.

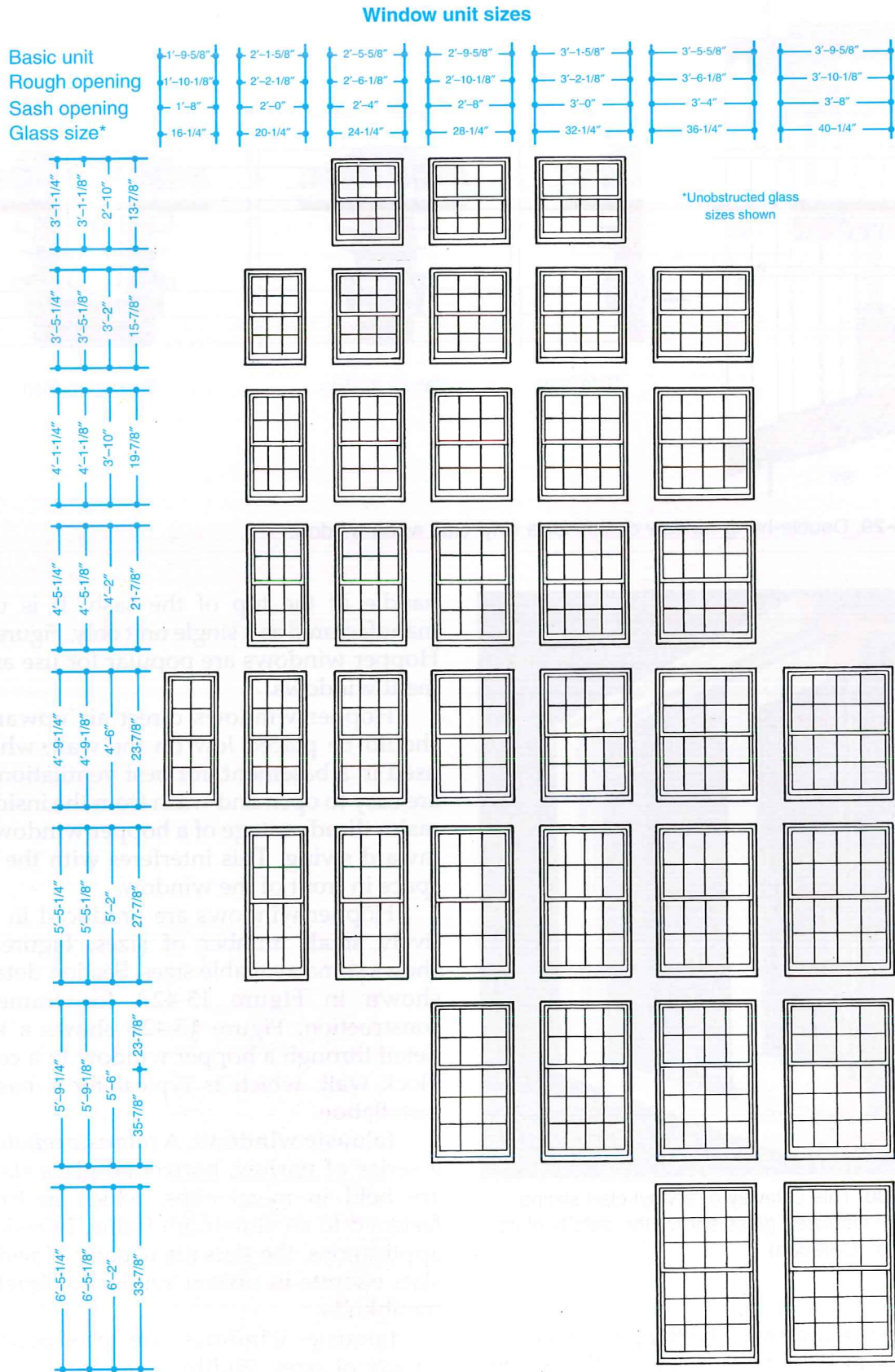


Figure 15-28. Standard sizes of double-hung windows.

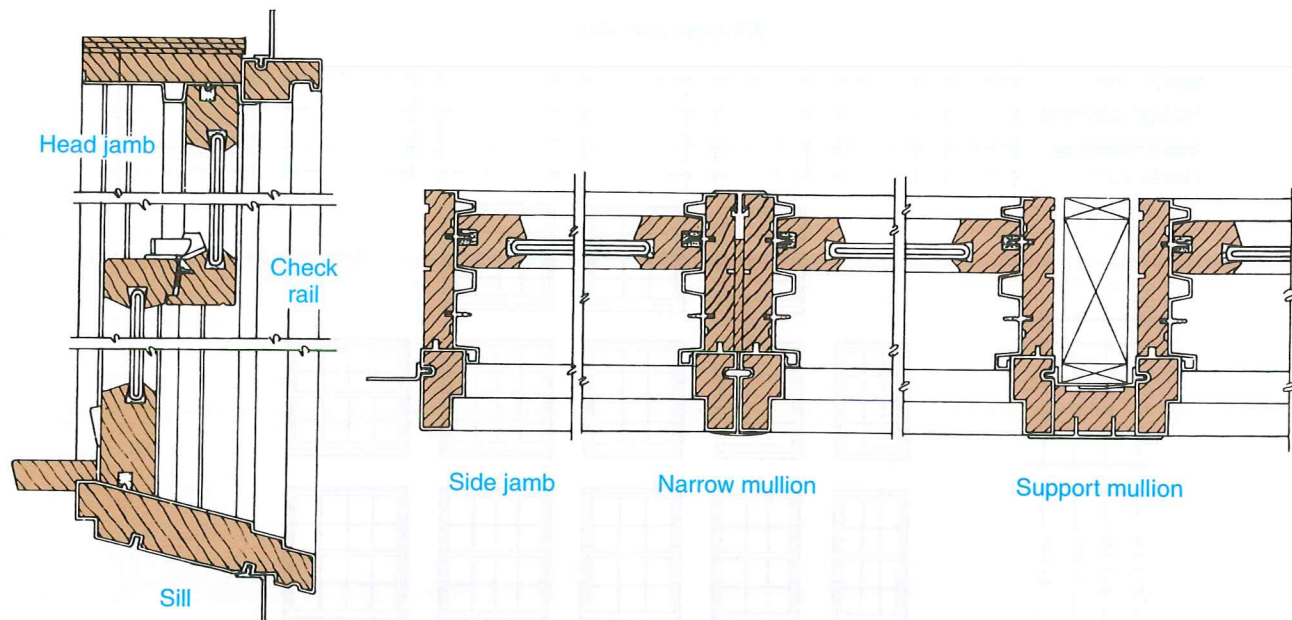


Figure 15-29. Double-hung window details for a vinyl-clad wood window.



Figure 15-30. This cutaway of a vinyl-clad sliding window with insulated glass shows the details of its construction. (Caradco)

Hopper windows. The *hopper window* is usually a window that is hinged at the bottom and swings to the inside of the house. It is hinged at the bottom and is opened by a lock-

handle at the top of the sash. It is usually manufactured as a single unit only, Figure 15-40. Hopper windows are popular for use as basement windows.

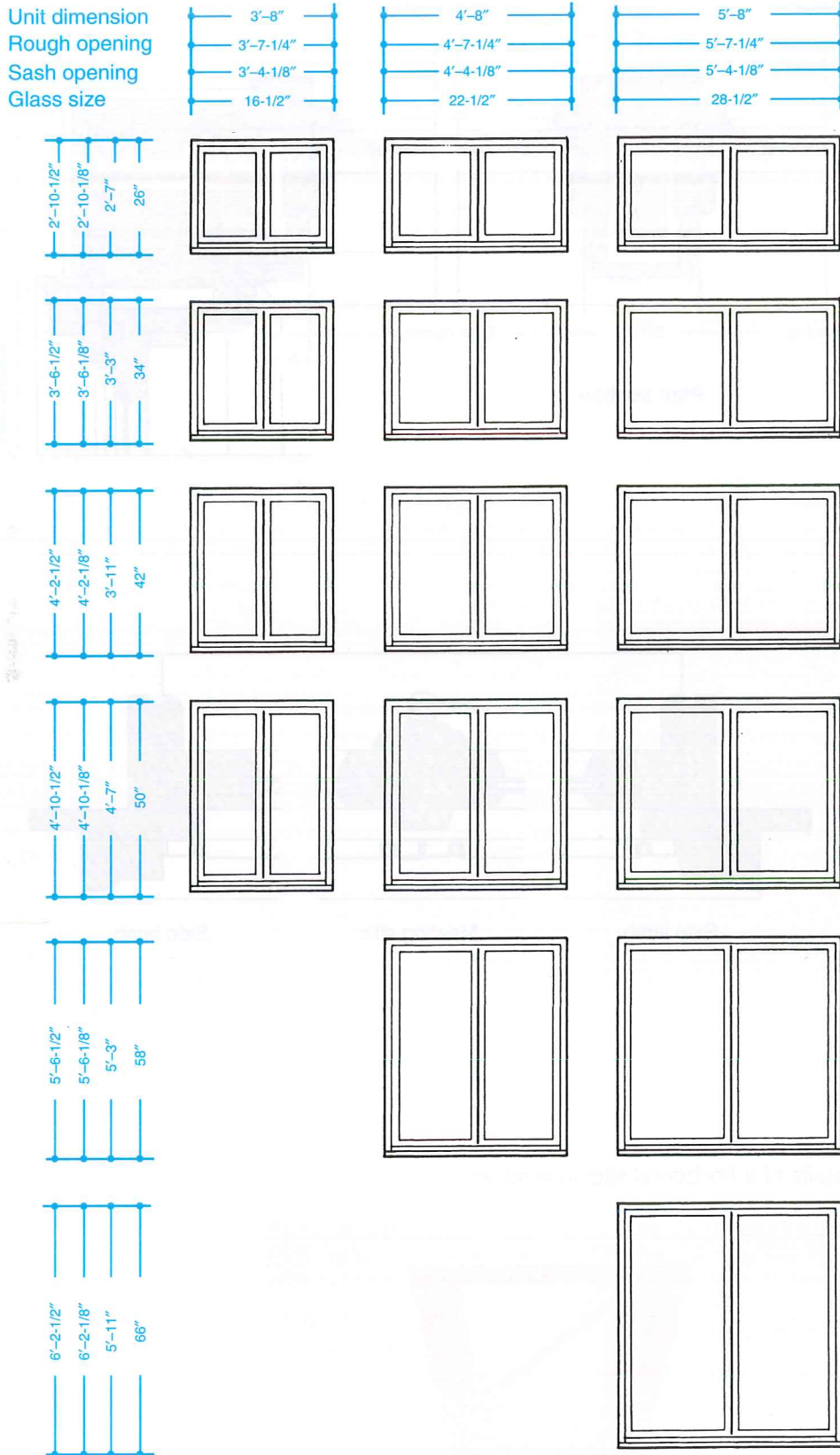
Hopper windows direct air upward and should be placed low on the wall; when not used in a basement, for best ventilation. They are easy to open and wash from the inside. The major disadvantage of a hopper window is the inward swing. This interferes with the use of space in front of the window.

Hopper windows are produced in a relatively small number of sizes. Figure 15-41 shows some available sizes. Section details are shown in Figure 15-42A for frame wall construction. Figure 15-42B shows a section detail through a hopper window in a concrete block wall, which is typical for a basement installation.

Jalousie windows. A *jalousie window* has a series of narrow, horizontal glass slats that are held in metal clips, which in turn are fastened to an aluminum frame. In residential applications, the slats are usually 3" wide. The slats operate in unison similar to Venetian or miniblinds.

Jalousie windows are produced in a variety of sizes. Widths range from 18" to 48" in increments of 2". Lengths are available from 17" to 99-1/2" in increments of 2-1/2". Louver

Sizes and layouts



All openings shown are single units having two sashes that slide past each other and are in the same plane when closed. All sashes are furnished one light.

Unit dimensions

Unit dimensions shown are exact overall dimensions with exterior casing applied. Height dimensions are taken from the top of head casing to the bottom edge of sill. Width dimensions are taken from the back of the side casing to the back of the side casing.

Multiple openings

4-3/4" Mullion – Units are joined with 3/4" filler between 2" casings. Add 3/4" to the single Unit Dimension for each mullion used for the Overall Unit Dimension Width. Deduct 3/4" from the Overall Unit Dimension for the Overall Rough Opening Width.

4" Casing mullion – Units are joined with 2" casings back-to-back with sill horns butted. Head and sill lugs must be cut off. Overall Unit Dimension Width is the sum of individual Unit Dimensions. For the Overall Rough Opening Width, deduct 3/4" from the Overall Unit dimension Width.

2" Casing mullion – Units are joined with jambs back-to-back with 2" exterior casing. Head and sill lugs and sill horns must be cut off. For Overall Unit Dimension Width, deduct 2" from the single Unit Dimensions. For Rough Opening, deduct 3/4" from the Overall Unit Dimension.

Figure 15-31. Sizes of horizontal sliding windows.

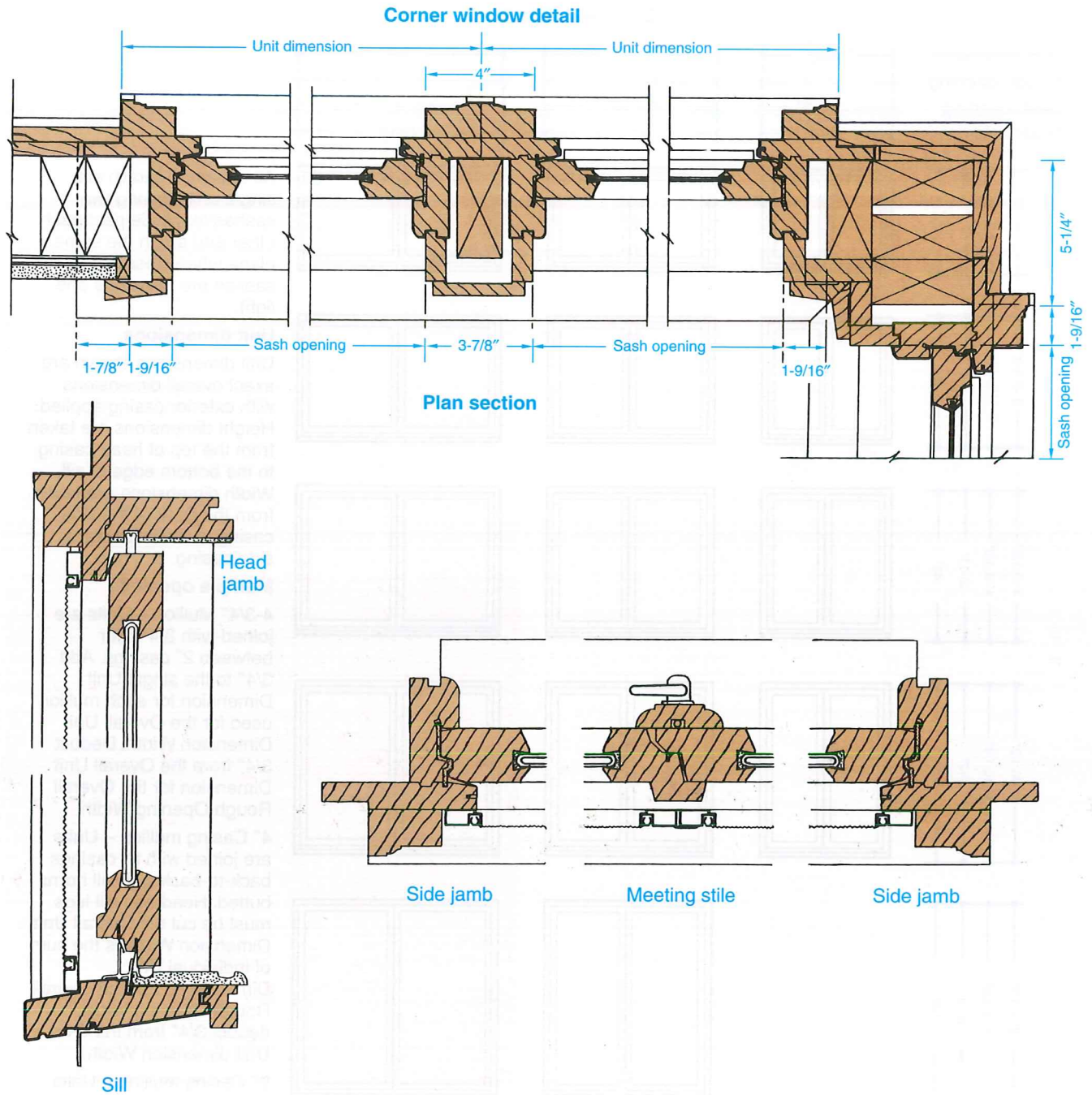


Figure 15-32. Construction details of a horizontal sliding window.



Figure 15-33. Casement windows are hinged on their side and can be operated with a hand crank. (Marvin Windows)

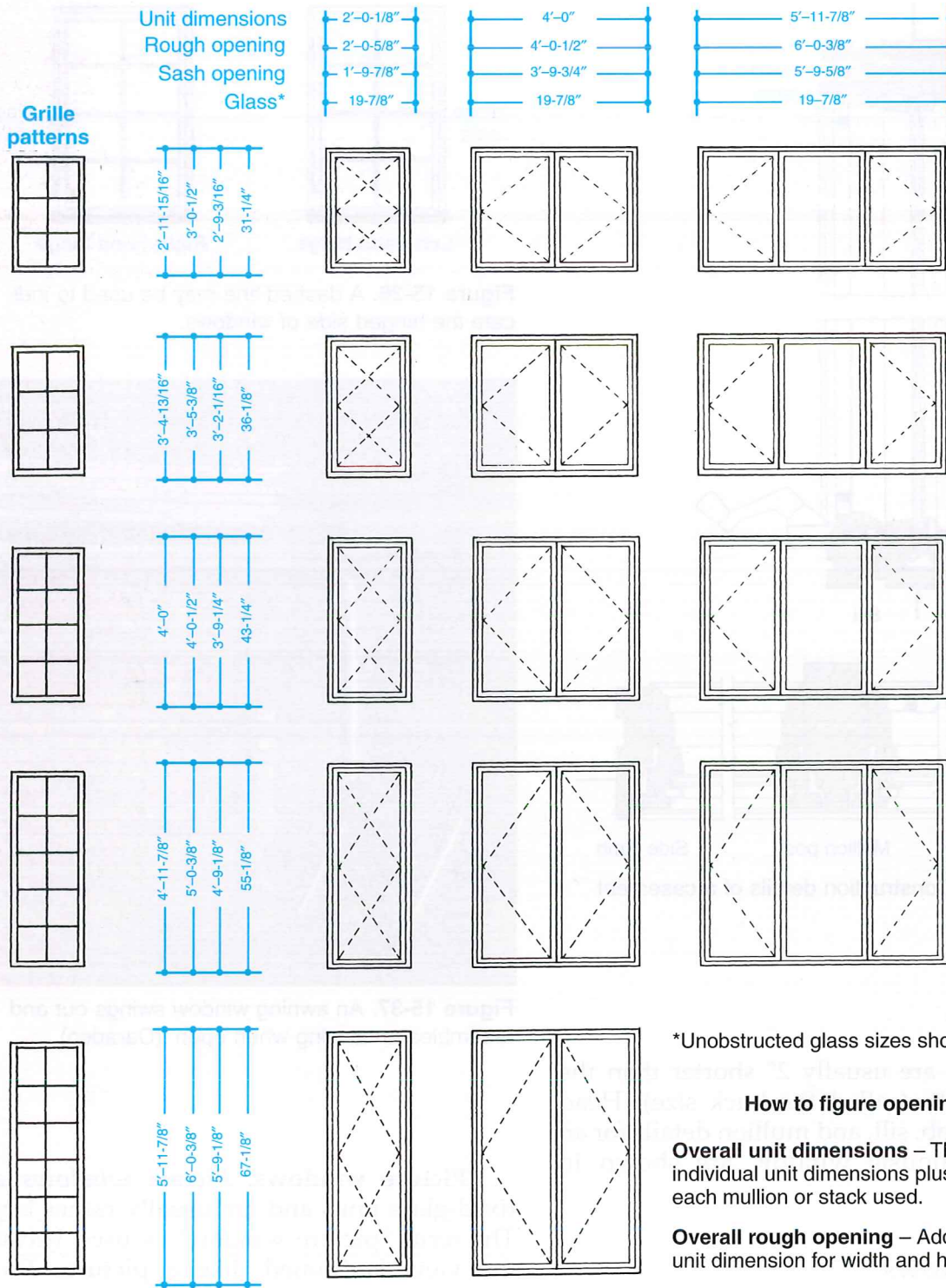


Figure 15-34. Standard casement window sizes.

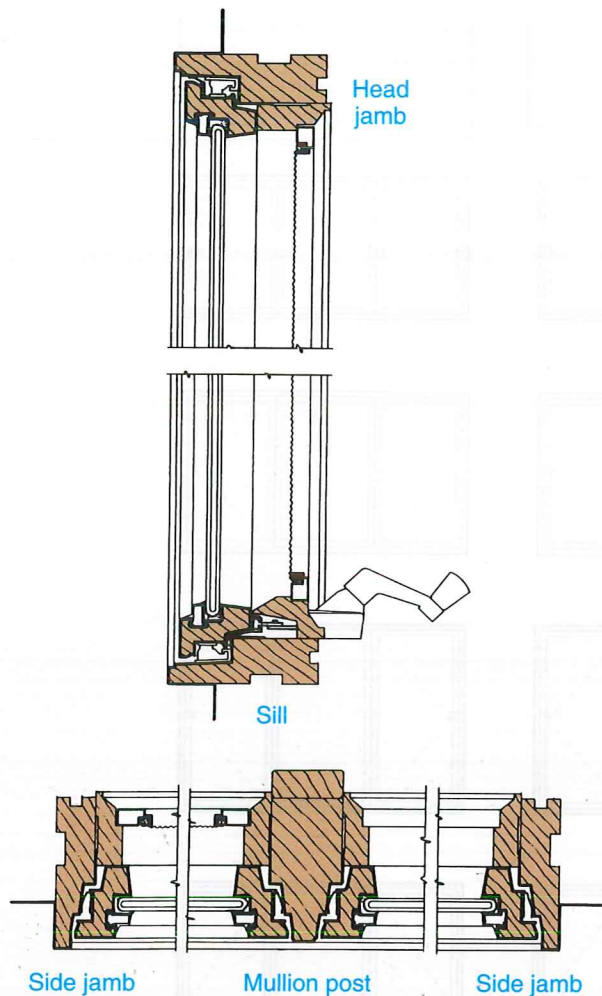


Figure 15-35. Construction details of a casement window.

(slat) lengths are usually 2" shorter than the window width (called the buck size). Head jamb, side jamb, sill, and mullion details for an aluminum jalousie window are shown in Figure 15-43.

Fixed windows

The purpose of fixed windows is to provide a view and/or admit light. They do not permit ventilation. Fixed windows are more likely to be custom made and, therefore, may be sized for a specific application. Since they do not open, weather stripping, hardware, and screens are not required. Examples of fixed windows include picture windows, circle top windows, and special shapes.

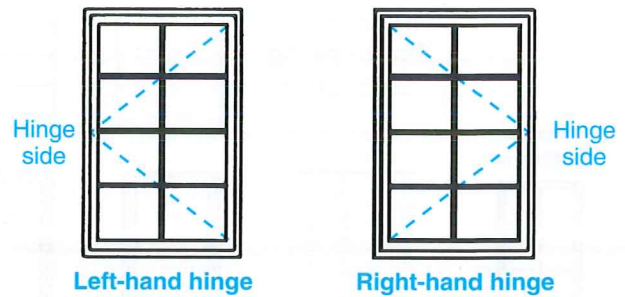


Figure 15-36. A dashed line may be used to indicate the hinged side of windows.



Figure 15-37. An awning window swings out and resembles an awning when open. (Caradco)

Picture windows. *Picture windows* are fixed-glass units and are usually rather large. The term "picture window" is used because the view is framed, like a picture. These windows are often the center unit of a group of regular windows. See Figure 15-44.

Picture windows may be purchased in standard sizes or custom-made on the job. Figure 15-45A gives the standard sizes of picture window units produced by one manufacturer. Figure 15-45B illustrates the construction details of a manufactured picture window.

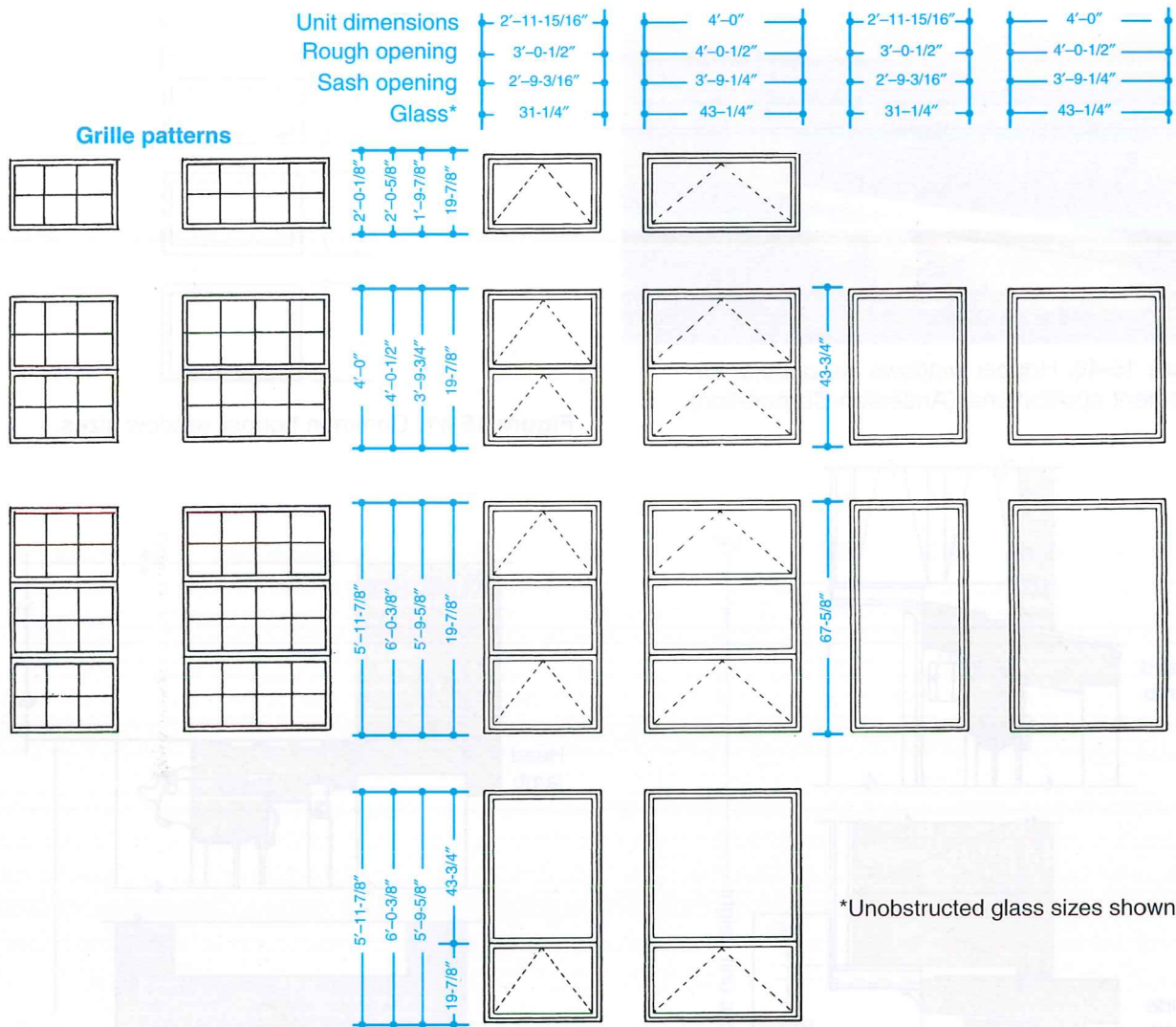


Figure 15-38. Standard awning window sizes.

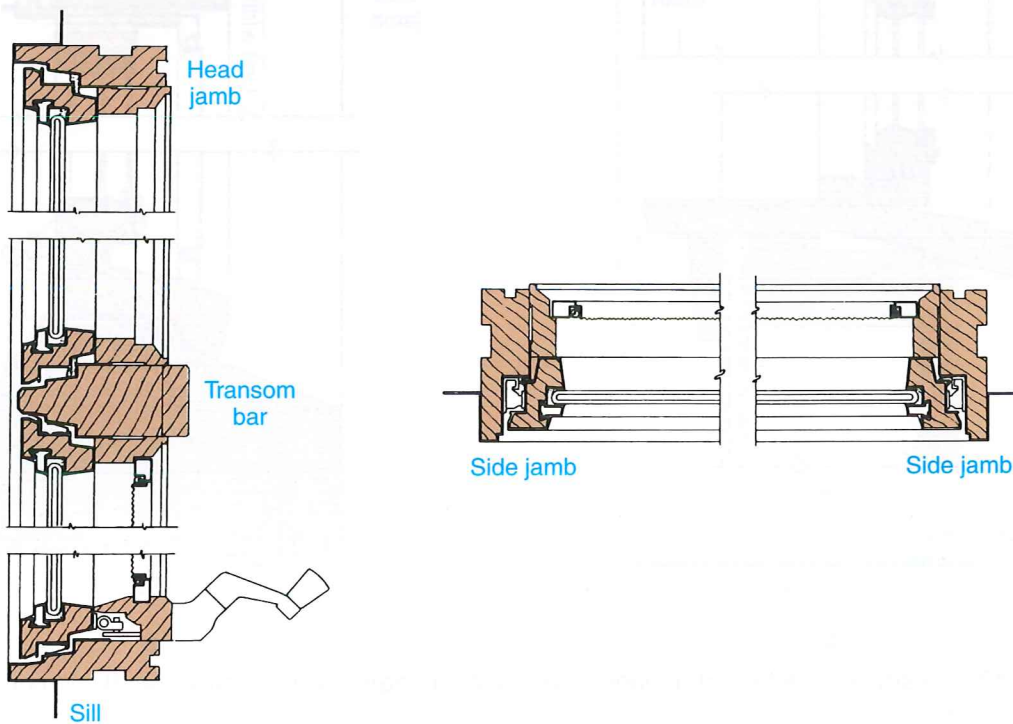


Figure 15-39. Construction details of an awning window.

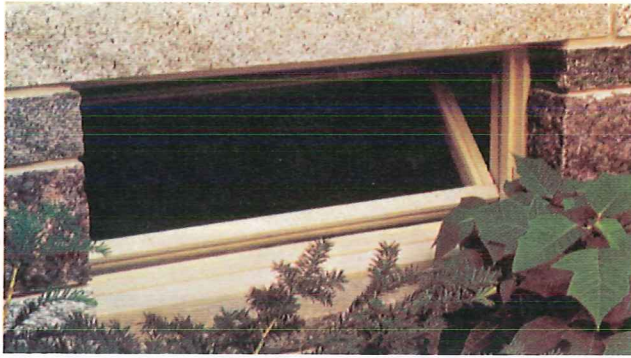


Figure 15-40. Hopper windows are popular for basement applications. (Andersen Corporation)

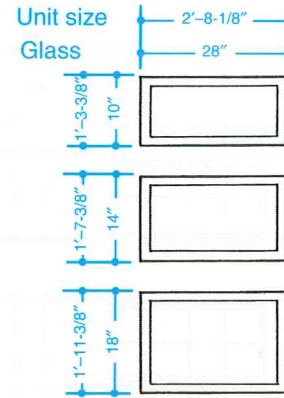
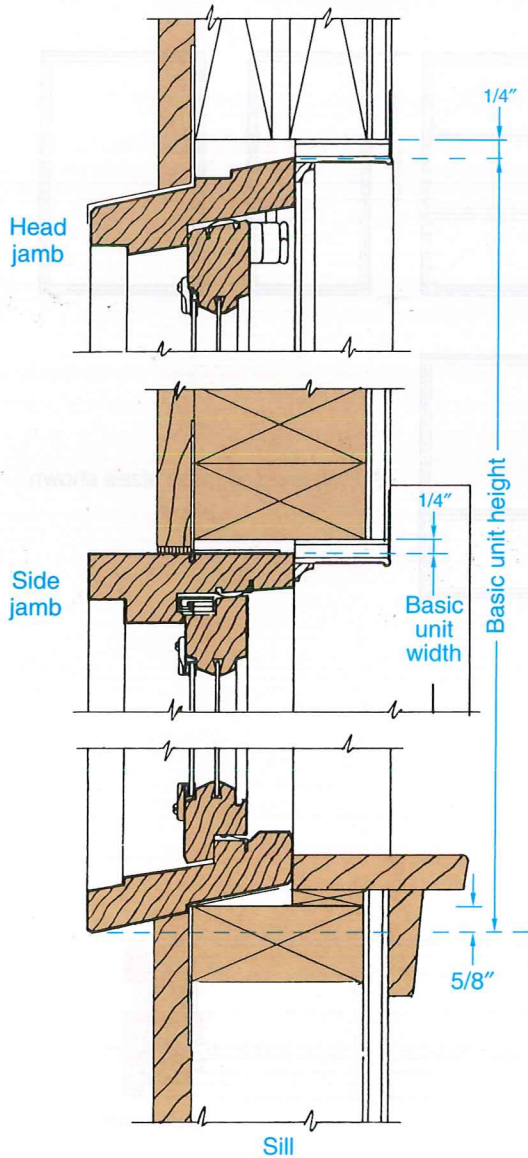
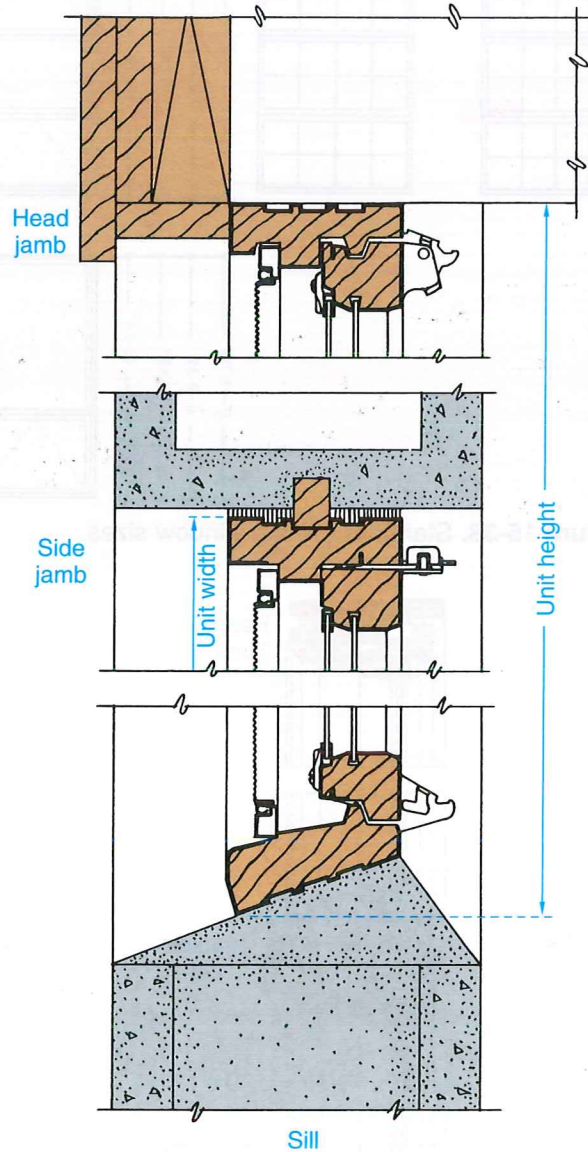


Figure 15-41. Common hopper window sizes.



Single frame wall construction with drywall interior returned into jambs. Note position of unit in wall.

A



B

Figure 15-42. Construction details of hopper windows. A—In frame wall construction. B—In concrete block wall construction.

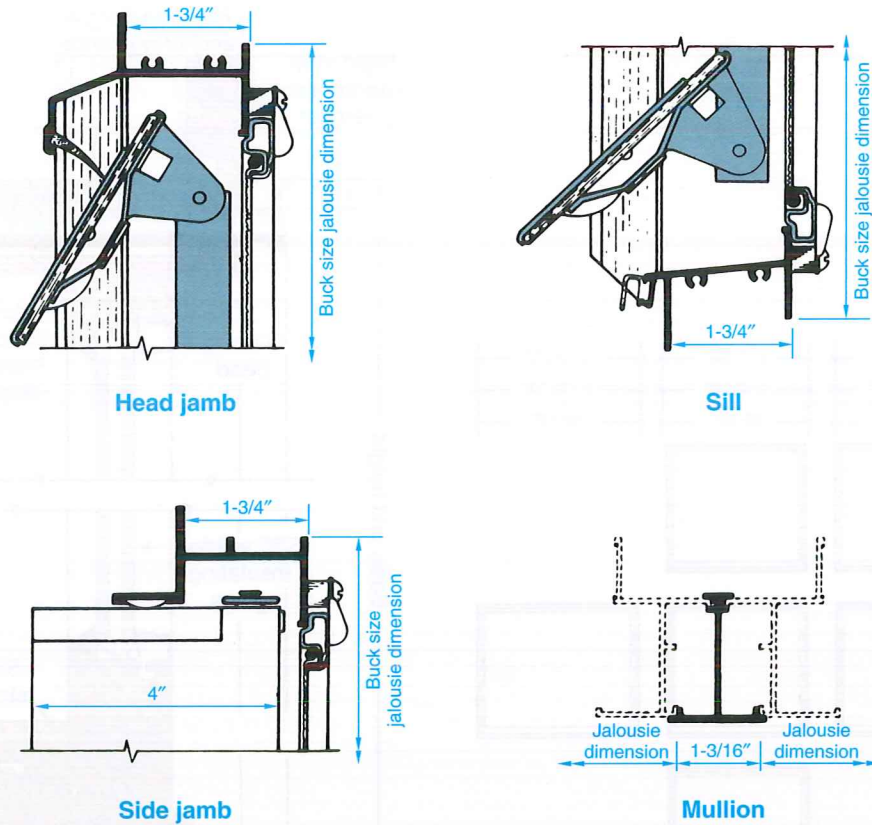


Figure 15-43. Construction details of an aluminum jalousie window.



Figure 15-44. The center window is a picture window and consists of a large, fixed glass section. The design element of dividers in the adjacent double-hung windows is carried over to the picture window. Note: The three windows as a unit may be considered a bay window. (Pella/Rolscreen Company)

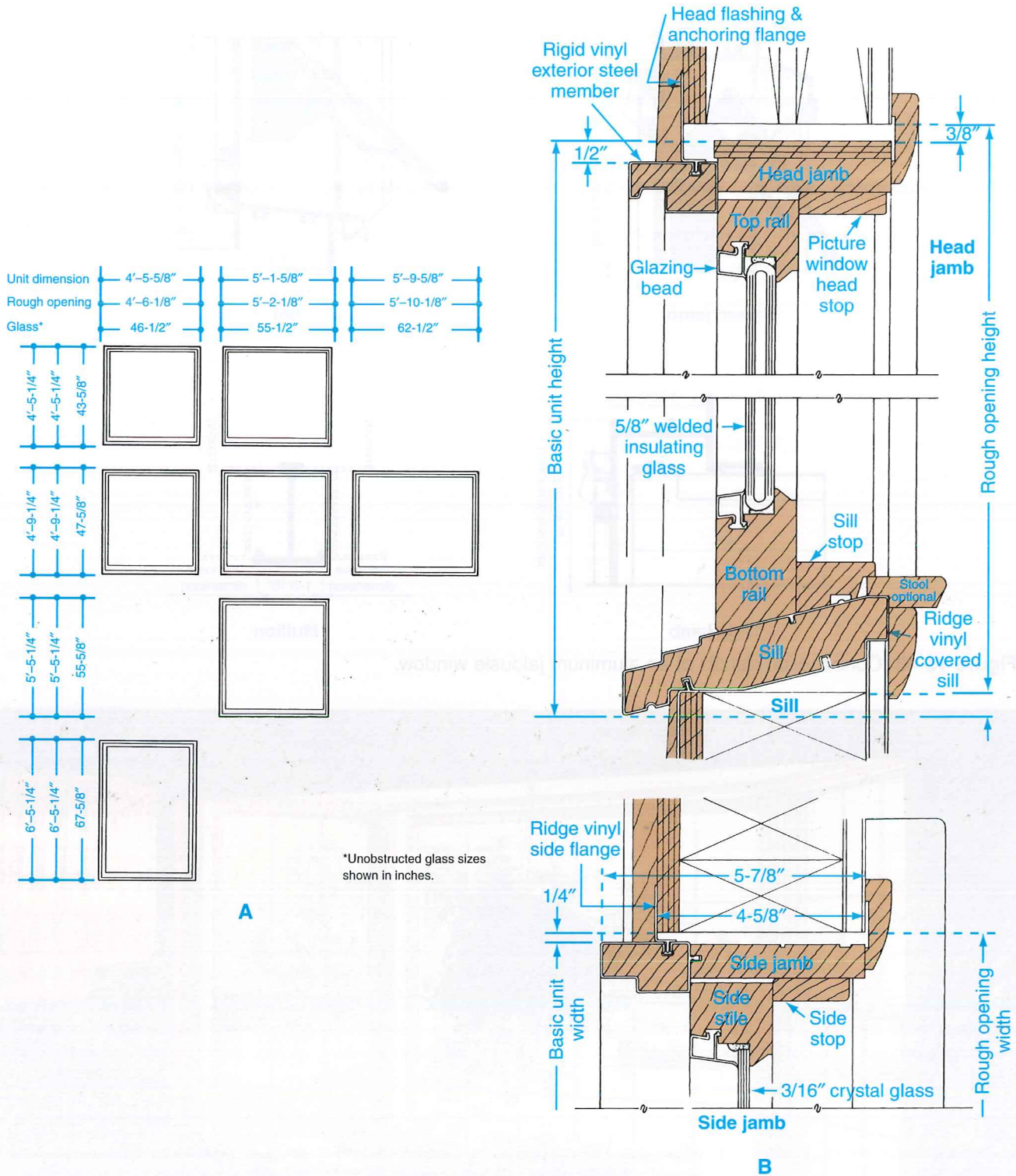


Figure 15-45. A—Standard picture window sizes in sash units. B—Construction details of a picture window.

Circle top windows. *Circle top windows* are circular windows typically installed above another window. They are available in quarter circles, half circles, ellipses, or full circles. Circle tops can be installed as single units or

joined to other types of windows, Figure 15-46. Figure 15-47A shows the standard sizes produced by one manufacturer. A typical construction detail of a manufactured circle top window is shown in Figure 15-47B.

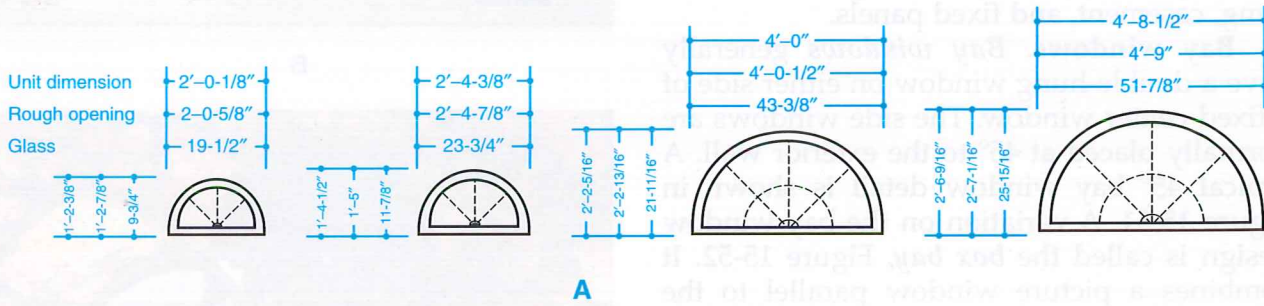


A

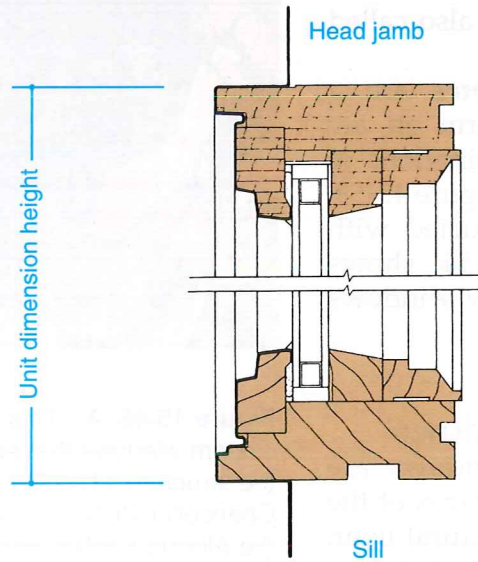


B

Figure 15-46. Circle top windows. A—With a casement window in a single unit. (Shouldice) B—In combination with a door and double-hung windows. (Peachtree Doors, Inc.)



A



B

Figure 15-47. A—Typical standard sizes of circle top windows. B—Construction details of a circle top window.

Special-shape windows. *Special-shape windows* provide a wide range of interesting design options that can be used to individualize residential structures, Figure 15-48. These units are fixed windows in made-to-order shapes and sizes. If produced by the same manufacturer as other windows in the house, they may be combined with most any standard window to create a dramatic effect. Figure 15-49 shows some of the most popular special-shape windows.

Combination windows

Combination windows are a mixture of two or more types of windows. The three most popular types include bay windows, bow windows, and picture windows combined with swinging or sliding windows.

Bay and bow windows are combination windows that project out from the structure, Figure 15-50. They may be constructed using most any kind of windows including double-hung, casement, and fixed panels.

Bay windows. *Bay windows* generally have a double-hung window on either side of a fixed center window. The side windows are normally placed at 45° to the exterior wall. A typical 45° bay window detail is shown in Figure 15-51. A variation on the bay window design is called the *box bay*, Figure 15-52. It combines a picture window parallel to the wall with two casement windows placed at 90° to the wall. Box bay windows are also called garden windows.

Bow windows. *Bow windows* are a combination of windows that form an arc extending outside the wall. Combinations of four to seven units are common, Figure 15-53. Bow windows are usually constructed with casement windows. Figure 15-54 shows typical plan views for several bow windows using casements.

Skylights and clerestory windows

Skylights and clerestory windows are generally used to admit light into areas of the structure that receive little or no natural light. *Skylights* are located on the roof. *Clerestory windows* are placed high on a wall. See Figure 15-55. The use of these windows, especially



A



B



C

Figure 15-48. A—This contemporary home features custom windows that enhance the overall design of the structure. (The Oshkosh, WI private residence of Chancellor Richard H. Wells and family—formerly the Alberta Kimball Home) B—This full circle window adds visual interest to the house. C—This unique custom window adds an individual touch. (Weather Shield Mfg., Inc.)

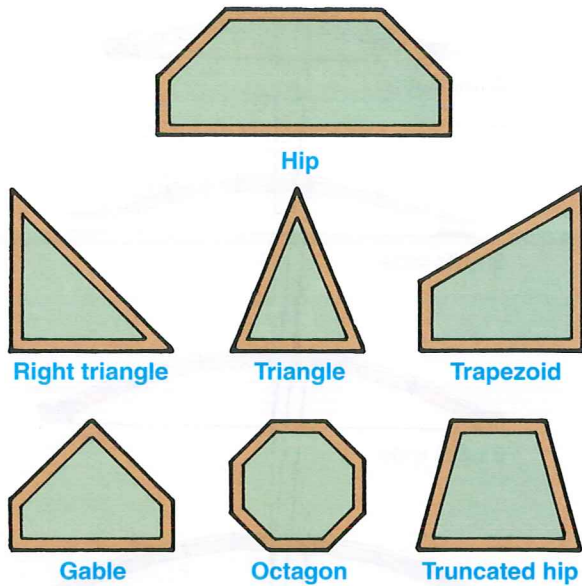


Figure 15-49. These are the most popular shapes of special-shape windows.



Figure 15-50. A unique bay window especially suited for this location. (Marvin Windows)

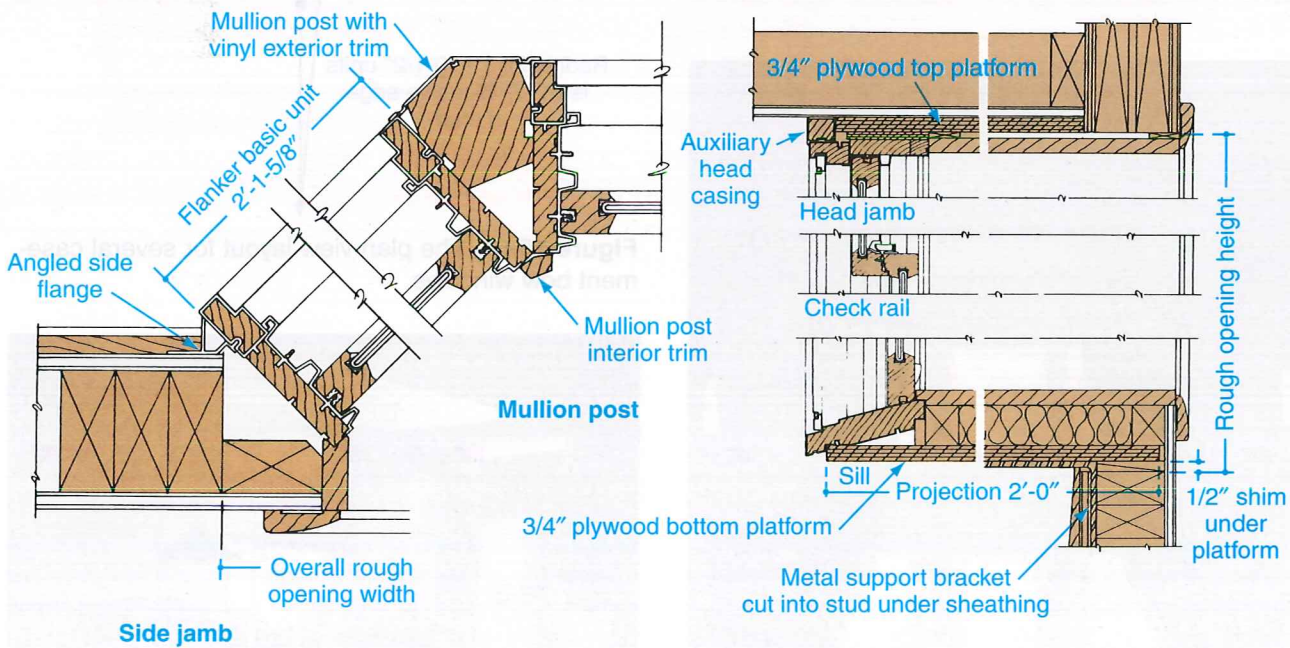


Figure 15-51. Construction details of a typical 45° bay window.

clerestory windows, can produce pleasing architectural effects. Some skylights and clerestory windows may be opened for ventilation.

Skylights are available in several basic sizes and shapes. The most common shape is rectangular and designed to fit between the

roof trusses, Figure 15-56. Custom-made skylights are possible to meet most any design situation, Figure 15-57. Clerestory windows may be custom-made fixed windows or a series of standard windows, Figure 15-58.



Figure 15-52. A typical box bay window provides an excellent location for plants. (Andersen Corporation)



Figure 15-53. This large bow window provides a panoramic view. (Pozzi Wood Windows)

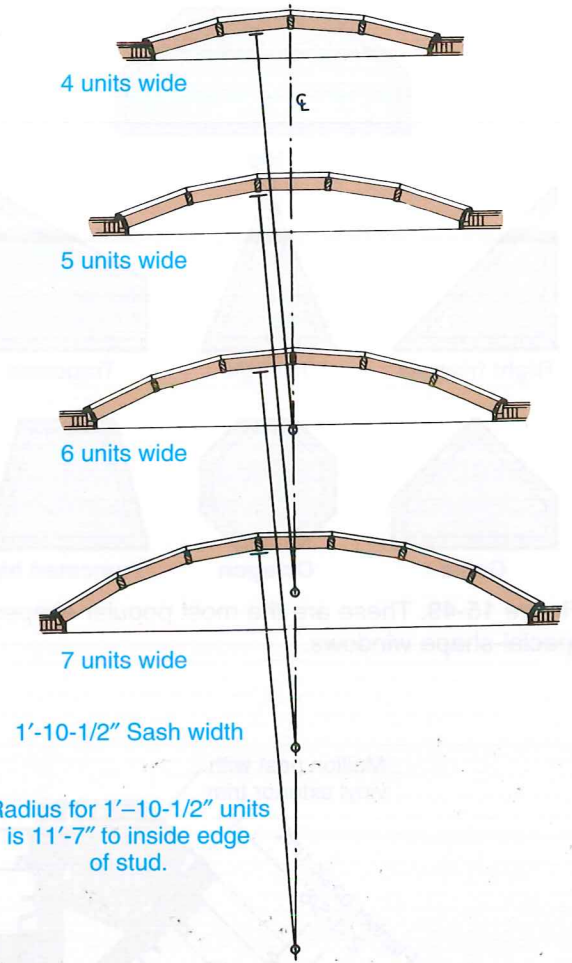


Figure 15-54. The plan view layout for several case-bow windows.



Figure 15-55. A unique application of both clerestory windows and skylights. (KraftMaid Cabinetry)



Figure 15-56. This rectangular skylight is designed to fit between the roof trusses. (Pella/Rolscreen Company)



Figure 15-58. The clerestory windows shown here are a series of standard windows. (Manufactured Housing Institute)



Figure 15-57. These custom skylights provide a contemporary accent to the ceiling of this “retro-styled” kitchen. (Lis King)

Window Schedules

A *window schedule* provides information about all windows in a structure such as type of window, size, identifying symbol, manufacturer’s number, and installation. The window schedule may be placed on the same sheet as the floor plan or elevation, if space permits. Otherwise, it may be located on one of the other drawings. Care must be taken to ensure that all windows are listed on the schedule and are properly identified. A sample window schedule is shown in Figure 15-59.

Window schedule						
Sym.	Quan.	Type	Rough opening	Sash size	Manufacturer's number	Remarks
A	6	Casement	3'-6-1/8" × 5'-1"	3'-2-1/4" × 4'-9-1/4"	3N3	Primed, screens, insulating glass
B	1	Casement	3'-6-1/8" × 3'-3-1/4"	3'-2-1/4" × 3'-1-1/2"	2N3	Primed, screens, insulating glass
C	1	Casement	5'-6-1/2" × 8'-4-1/2"	5'-2-5/8" × 8'-1"	5N5	Primed, screens, insulating glass
D	1	Casement	2'-5-7/8" × 3'-5-1/4"	2'-2" × 3'-1-3/4"	2N2	Primed, screens, insulating glass
E	5	Hopper	1'-8" × 5'-5"	1'-4" × 5'-2"	314	Exterior casing or subsill not included
F	2	Fixed	2'-4" × 6'-9-1/4"	See remarks	Custom	Glass size – 2'-0" × 6'-8" insul.

Figure 15-59. This typical window schedule layout includes the necessary information.

Internet Resources

www.alcoahomes.com

*Aluminum Company of America (ALCOA)
Building Products, Inc*

www.caradco.com

*Caradco, a manufacturer of wood windows
and patio doors*

www.hurd.com

Hurd Windows and Patio Doors

www.marvin.com

Marvin Windows and Doors

www.mihomeproducts.com

*MI Home Products, a manufacturer of
windows and doors*

www.pella.com

*Pella Corporation, a manufacturer of
windows and doors*

www.pinecrestinc.com

*Pinecrest, Inc., a manufacturer of fine custom
wood products*

www.pozzi.com

Pozzi Wood Windows

www.velux.com

Velux, supplier of roof windows and skylights

www.windsorwindows.com

Windsor Windows and Doors

Review Questions – Chapter 15


Write your answers on a separate sheet of paper.
Do not write in this book.

- List five functions of doors and windows.
- Name eight types of interior doors.
- Interior flush doors are usually _____ thick.
- The horizontal members in panel doors are called _____ and vertical members are called _____.
- The main use of bi-fold doors in residential construction is for _____.
- Standard height for most interior and exterior doors is _____.

- A door that hangs from a track mounted on the head jamb and slides into the wall when opened is a _____ door.
- A door that swings through a 180° arc is called a _____ door.
- Name two ways in which exterior doors are different from interior doors.
- Exterior doors are usually _____ wide.
- The most common type of garage door is the _____ type.
- Door and window construction details are usually section drawings cut through the _____, _____, and _____.
- What is the function of a drip cap?
- The glass area should be at least _____ percent of the floor area of any room.
- Name one type of window that does not provide ventilation.
- Name four different types of windows.
- The small vertical and horizontal bars that separate the total glass area into smaller units are called _____.
- What does the rough opening size of a window represent?
- Which window is hinged at the side and swings out?
- A window that is commonly used in basements is the _____ window.
- Information about all windows shown in the architectural drawings is recorded on a _____.

Suggested Activities

- Make a list of the types and sizes of doors and windows in your home. Obtain sales literature from various manufacturers for the doors and windows on your list.
- Build a scale model of an exterior or interior door, jambs, and rough framing. Use CADD to make plan, elevation, and section drawings. Present the model and drawings to the class explaining the features.

- 
3. Select a floor plan for a small- to medium-size house. Using CADD, draw the floor plan. Then, plan the windows for the house following the guidelines presented in this chapter for ventilation, light, and view. Insert window symbols into the walls. Design and draw new symbols as needed. Finally, create a window schedule for the house.
 4. Visit a local lumber company and examine the cutaway models of the windows they carry. Measure the various parts of one model and prepare a sketch. Identify the type of window and the manufacturer. Collect any specification data about the windows that you can and bring the material to class for reference purposes.
 5. Using CADD, draw various window and door symbols. Add these to your symbols library for future use.
- 