# CHAPTER 6

# INTERIOR FINISH OF FLOORS, STAIRS, DOORS, AND TRIM

This chapter continues our discussion of interior finishing. In the previous chapter, we looked at the interior finishing of walls and ceilings, and related aspects of insulation and ventilation. Now, we'll examine the common types of flooring and the construction procedures for a stairway and interior doorframing. We'll also discuss the types of wood trim and the associated installation procedures.

## FLOOR COVERINGS

*LEARNING OBJECTIVE: Upon completing this section, you should be able to identify the common types of floor coverings and describe procedures for their placement.*

Numerous flooring materials now available may be used over a variety of floor systems. Each has a property that adapts it to a particular usage. Of the practical properties, perhaps durability and ease of maintenance are the most important. However, initial cost, comfort, and appearance must also be considered. Specific service requirements may call for special properties, such as resistance to hard wear in warehouses and on loading platforms, or comfort to users in offices and shops.

There is a wide selection of wood materials used for flooring. Hardwoods and softwoods are available as strip flooring in a variety of widths and thicknesses, and as random-width planks and block flooring. Other materials include linoleum, asphalt, rubber, cork vinyl, and tile and sheet forms. Tile flooring is also available in a particleboard, which is manufactured with small wood particles combined with resin and formed under high pressure. In many areas, ceramic tile and carpeting are used in ways not thought practical a few years ago. Plastic floor coverings used over concrete or a stable wood subfloor are another variation in the types of finishes available.

### WOOD-STRIP FLOORING

Softwood finish flooring costs less than most hardwood species and is often used to good advantage in bedroom and closet areas where traffic is light. However, it is less dense than the hardwoods, less wear-resistant, and shows surface abrasions more readily. Softwoods most commonly used for flooring are southern pine, Douglas fir, redwood, and western hemlock.

Softwood flooring has tongue-and-groove edges and may be hollow-backed or grooved. Some types are also end-matched. Vertical-grain flooring generally has better wearing qualities than flat-grain flooring under hard usage.

Hardwoods most commonly used for flooring are red and white oak, beech, birch, maple, and pecan, any of which can be prefinished or unfinished.

Hardwood strip flooring is available in widths ranging from 1 1/2 to 3 1/4 inches. Standard thicknesses include 3/8, 1/2, and 3/4 inch. A useful feature of hardwood strip flooring is the undercut. There is a wide groove on the bottom of each piece that enables it to lay flat and stable, even when the subfloor surface is slightly uneven.

These strips are laid lengthwise in a room and normally at right angles to the floor joists. A subfloor of diagonal boards or plywood is normally used under the finish floor. The strips are tongue and groove and end-matched (fig. 6-1, view A). Strips are random length

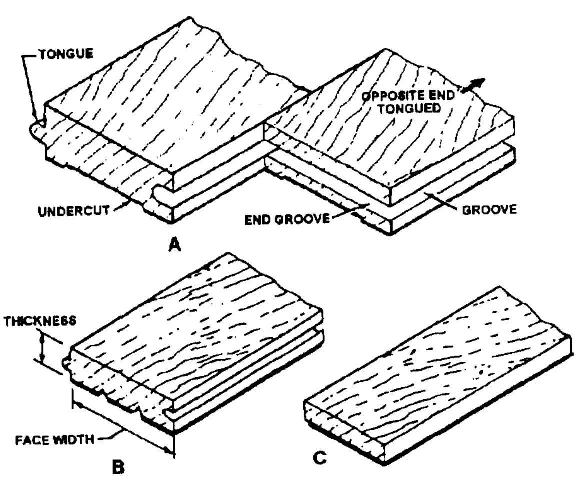



Figure 6-1.—Types of strip flooring.

and may vary from 2 to more than 16 feet. The top is slightly wider than the bottom so that tight joints result when flooring is laid. The tongue fits tightly into the groove to prevent movement and floor squeaks.

Thin strip flooring (fig. 6-1. view B) is made of 3/8- by 2-inch strips. This flooring is commonly used for remodeling work or when the subfloor is edge-blocked or thick enough to provide very little deflection under loads.

Square-edged strip flooring (fig. 6-1, view C) is also occasionally used. The strips are usually 3/8 inch by 2 inches and laid over a substantial subfloor. Face-nailing is required for this type of flooring.

Plank floors are usually laid in random widths. The pieces are bored and plugged to simulate wooden pegs originally used to fasten them in place. Today, this type of floor has tongue-and-groove edges. It is laid similar to regular strip flooring. Solid planks are usually 3/4 inch thick. Widths range from 3 to 9 inches in multiples of 1 inch.

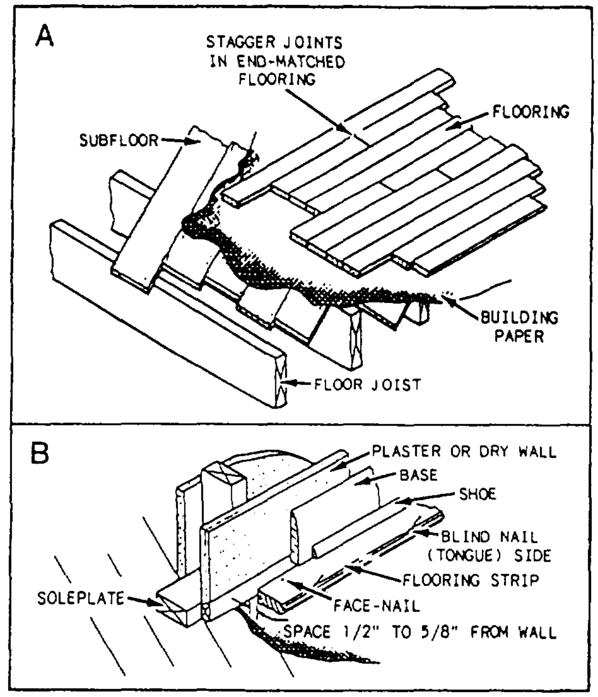



Figure 6-2.—Application of strip flooring.

### Installation

Flooring should be laid after drywall, plastering, or other interior wall and ceiling finish is completed and dried out. Windows and exterior doors should be in place, and most of the interior trim, except base, casing, and jambs, should be installed to prevent damage by wetting or construction activity.

Board subfloors should be clean and level and covered with felt or heavy building paper. The felt or paper stops a certain amount of dust, somewhat deadens sound, and, where a crawl space is used, increases the warmth of the floor by preventing air infiltration. As a guide to provide nailing into the joists, wherever possible, mark with a chalk line the location of the joists on the paper. Plywood subflooring does not normally require building paper.

Strip flooring should normally be laid crosswise to the floor joists (fig. 6-2, view A). In conventional structures, the floor joists span the width of the building over a center-supporting beam or wall. Thus, the finish flooring of the entire floor areas of a rectangular structure will be laid in the same direction. Flooring with “L”- or “I”-shaped plans will usually have a direction change, depending on joist direction. As joists usually span the short way in a room, the flooring will be laid lengthwise to the room. This layout has a pleasing appearance and also reduces shrinkage and swelling of the flooring during seasonal changes.

### Storing

When the flooring is delivered, store it in the warmest and driest place available in the building. Moisture absorbed after delivery to the building site is the most common cause of open joints between flooring strips that appear after several months of the heating season.

### Floor Squeaks

Floor squeaks are usually caused by the movement of one board against another. Such movement can occur for a number of reasons: floor joists too light, causing excessive deflection; sleepers over concrete slabs not held down tightly; loose fitting tongues; or poor nailing. Adequate nailing is an important means of minimizing squeaks. Another is to apply the finish floors only after the joists have dried to 12-percent moisture content or less. A much better job results when it is possible to nail through the finish floor, through the subfloor, and into the joists than if the finish floor is nailed only to the subfloor.

### Nailing

Various types of nails are used in nailing different thicknesses of flooring. Before using any type of nail, you should check with the floor manufacturer’s

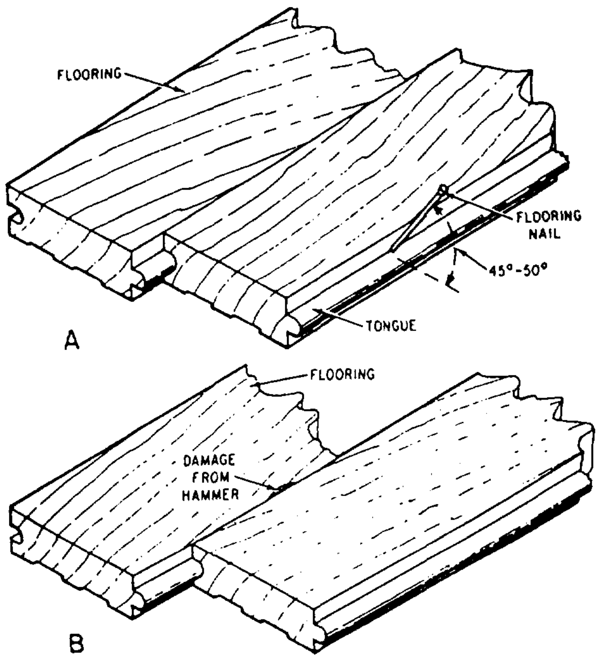



**Figure 6-3.—Nailing wood flooring.**

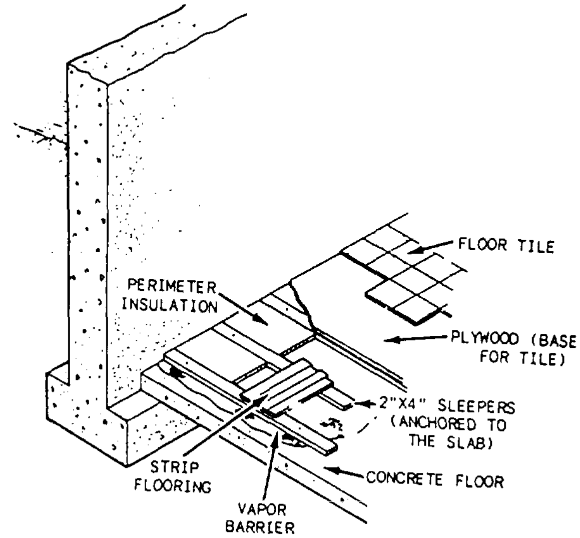



**Figure 6-4.—Floor detail for existing concrete construction.**

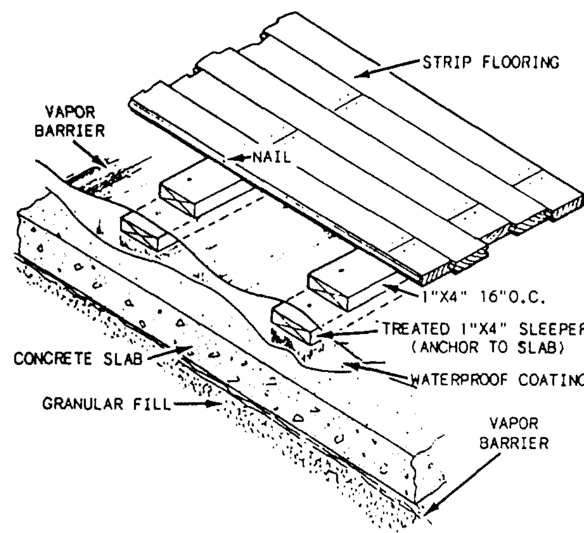



**Figure 6-5.—Base for wood flooring on a slab with vapor barrier.**

recommendations as to size and diameter for specific uses. Flooring brads are also available with blunted points to prevent splitting the tongue.

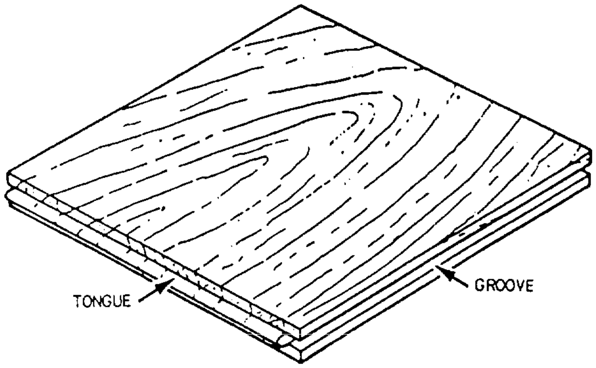
Figure 6-2, view B, shows how to nail the first strip of flooring. This strip should be placed 1/2 to 5/8 inch away from the wall. The space is to allow for expansion of the flooring when moisture content increases. The first nails should be driven straight down, through the board at the groove edge. The nails should be driven into the joist and near enough to the edge so that they will be covered by the base or shoe molding. The first strip of flooring can also be nailed through the tongue (fig, 6-3, view A). This figure shows in detail how nails should be driven into the tongue of the flooring at an angle of 45° to 50°. Don't drive the nails flush; this prevents damaging the edge by the hammerhead (fig. 6-3 view B). These nails should be set with a nail set.

To prevent splitting the flooring, predrill through the tongue, especially at the ends of the strip. For the second course of flooring from the wall, select pieces so that the butt joints are well separated from those in the first course. Under normal conditions, each board should be driven up tightly against the previous board. Cracked pieces may require wedging to force them into alignment or may be cut and used at the ends of the course or in closets. In completing the flooring, you should provide a 1/2- to 5/8-inch space between the wall and the last flooring strip. This strip should be face-nailed just like the first strip so that the base or shoe covers the set nailheads (fig. 6-2, view B).

### Installation over Concrete

One of the most critical factors in applying wood flooring over concrete is the use of a good vapor barrier under the slab to resist ground moisture. The vapor barrier should be placed under the slab during construction. However, an alternate method must be used when the concrete is already in place (shown in fig. 6-4).

A system of preparing a base for wood flooring when there is a vapor barrier under the slab is shown in figure 6-5. Treated 1-by 4-inch furring strips should be



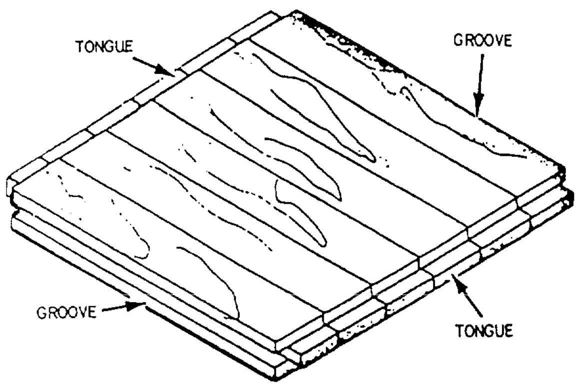




**Figure 6-6.—Wind block (parquet) laminated flooring.**

anchored to the existing slab. Shims can be used, when necessary, to provide a level base. Strips should be spaced no more than 16 inches on center (OC). A good waterproof or water-vapor resistant coating on the concrete before the treated strips are installed is usually recommended to aid in further reducing moisture movement. A vapor barrier, such as a 4-mil polyethylene or similar membrane, is then laid over the anchored 1- by 4-inch wood strips and a second set of 1 by 4s nailed to the first. Use 1 1/2-inch-long nails spaced 12 to 16 inches apart in a staggered pattern. The moisture content of these second members should be approximately the same as that of the strip flooring to be applied. Strip flooring can then be installed as previously described.

When other types of finish floor, such as a resilient tile, are used, plywood underpayment is placed over the 1 by 4s as a base.

## WOOD BLOCK FLOORING

Wood block (parquet) flooring (fig. 6-6) is used to produce a variety of elaborate designs formed by small wood block units. A block unit consists of short lengths of flooring, held together with glue, metal splines, or other fasteners. Square and rectangular units are produced. Generally, each block is laid with its grain at right angles to the surrounding units.

Blocks, called laminated units, are produced by gluing together several layers of wood. Unit blocks are commonly produced in 3/4-inch thicknesses. Dimensions (length and width) are in multiples of the widths of the strips from which they are made. For example, squares assembled from 2 1/4-inch strips are 6 3/4 by 6 3/4 inches, 9 by 9 inches, or 11 1/4 by 11 1/4 inches. Wood block flooring is usually tongue and groove.

## UNDERLAYMENT

Flooring materials, such as asphalt, vinyl, linoleum, and rubber, usually reveal rough or irregular surfaces in the flooring structure upon which they are laid. Conventional subflooring does not provide a satisfactory surface. An underpayment of plywood or hardboard is required. On concrete floors, a special mastic material is sometimes used when the existing surface is not suitable as a base for the finish flooring.

An underpayment also prevents the finish flooring materials from checking or cracking when slight movements take place in a wood subfloor. When used for carpeting and resilient materials, the underpayment is usually installed as soon as wall and ceiling surfaces are complete.

### Hardboard and Particleboard

Hardboard and particleboard both meet the requirements of an underpayment board. The standard thickness for hardboard is 1/4 inch. Particleboard thicknesses range from 1/4 to 3/4 inch.

This type of underpayment material will bridge small cups, gaps, and cracks. Larger irregularities should be repaired before the underlayment is applied. High spots should be sanded down and low areas filled. Panels should be unwrapped and placed separately around the room for at least 24 hours before they are installed. This equalizes the moisture content of the panels before they are installed.

**INSTALLATION.—** To install hardboard or particleboard, start atone corner and fasten each panel securely before laying the next. Some manufacturers print a nailing pattern on the face of the panel. Allow at least a 1/8- to 3/8-inch space next to a wall or any other vertical surface for panel expansion.

Stagger the joints of the underpayment panel. The direction of the continuous joints should be at right

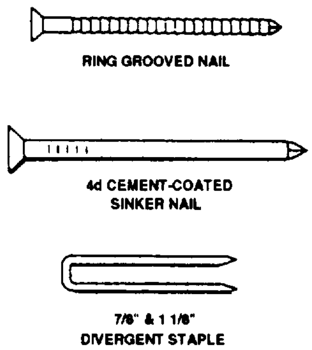



**Figure 6-7.—Fasteners for underpayment.**

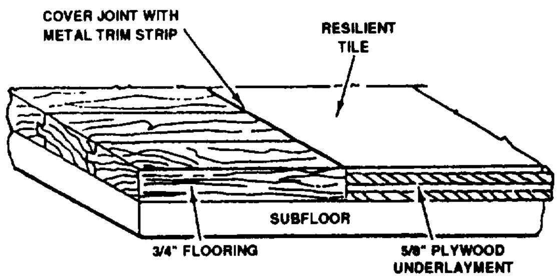



**Figure 6-8.—Alignment of finish flooring materials.**

angles to those in the subfloor. Be especially careful to avoid aligning any joints in the underpayment with those in the subfloor. Leave a 1/32-inch space at the joints between hardboard panels. Particleboard panels should be butted lightly.

**FASTENERS.—** Underlayment panels should be attached to the subfloor with approved fasteners. Examples are shown in figure 6-7. For hardboard, space the fasteners 3/8 inch from the edge.

Spacing for particleboard varies for different thicknesses. Be sure to drive nailheads flush. When fastening underpayment with staples, use a type that is etched or galvanized and at least 7/8 inch long. Staples should not be spaced over 4 inches apart along panel edges.

Special adhesives can also be used to bond under-payment to subfloors. They eliminate the possibility of nail-popping under resilient floors.

### Plywood

Plywood is preferred by many for underpayment. It is dimensionally stable, and spacing between joints is not critical. Since a range of thicknesses is available, alignment of the surfaces of various finish flooring materials is easy. An example of aligning resilient flooring with wood strip flooring is shown in figure 6-8.

To install plywood underpayment, follow the same general procedures described for hardboard. Turn the grain of the face-ply at right angles to the framing supports. Stagger the end joints. Nails may be spaced farther apart for plywood but should not exceed a field spacing of 10 inches (8 inches for 1/4- and 3/8-inch thicknesses) and an edge spacing of 6 inches OC. You should use ring-grooved or cement-coated nails to install plywood underpayment.

## RESILIENT FLOOR TILE

After the underpayment is securely fastened, sweep and vacuum the surface carefully. Check to see that surfaces are smooth and joints level. Rough edges should be removed with sandpaper or a block plane.

The smoothness of the surface is extremely important, especially under the more pliable materials (vinyl, rubber, linoleum). Over a period of time, these materials will "telegraph" (show on the surface) even the slightest irregularities or rough surfaces. Linoleum is especially susceptible. For this reason, a base layer of felt is often applied over the underpayment when linoleum, either in tile or sheet form, is installed.

Because of the many resilient flooring materials on the market, it is essential that each application be made according to the recommendations and instructions furnished by the manufacturer of the product.

### Installing Resilient Tile

Start a floor tile layout by locating the center of the end walls of the room. Disregard any breaks or irregularities in the contour. Establish a main centerline by snapping a chalk line between these two points. When snapping long lines, remember to hold the line at various intervals and snap only short sections.

Next, lay out another center line at right angles to the main center line. This line should be established by using a framing square or set up a right triangle (fig. 6-9)

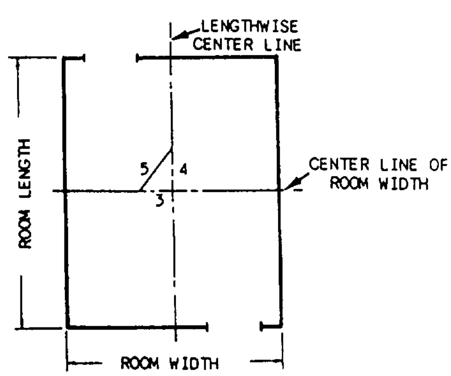



**Figure 6-9.—Establishing center for laying floor tile.**

with length 3 feet, height 4 feet, and hypotenuse 5 feet. In a large room, a 6:8: 10-foot triangle can be used. To establish this triangle, you can either use a chalk line or draw the line along a straightedge.

With the centerlines established, make a trial layout of tile along the center lines. Measure the distance between the wall and last tile. If the distance is less than 2 inches or more than 8 inches, move the centerline half the width of the tile (4 1/2 inches for a 9 by 9 tile) closer to the wall. This adjustment eliminates the need to install border tiles that are too narrow. (As you will learn shortly, border tiles are installed as a separate operation-after the main area has been tiled.) Check the layout along the other center line in the same way. Since the original center line is moved exactly half the tile size, the border tile will remain uniform on opposite sides of the room. After establishing the layout, you are now ready to spread the adhesive.

**SPREADING ADHESIVE.—** Before you spread the adhesive, reclean the floor surface. Using a notched trowel, spread the adhesive over one-quarter of the total area bringing the spread up to the chalk line but not covering it. Be sure the depth of the adhesive is the depth recommended by the manufacturer.

The spread of adhesive is very important. If it is too thin, the tile will not adhere properly. If too heavy, the adhesive will bleed between the joints.

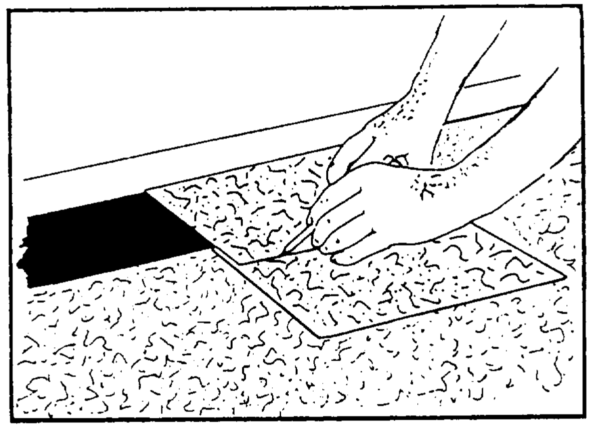


**Figure 6-10.—Layout of a border tile.**

Allow the adhesive to take an initial set before a single tile is laid. The time required will vary from a minimum of 15 minutes to a much longer time, depending on the type of adhesive used. Test the surface with your thumb. It should feel slightly tacky but should not stick to your thumb.

**LAYING THE TILE.—** Start laying the tile at the center of the room. Make sure the edges of the tile align with the chalk line. If the chalk line is partially covered with the adhesive, snap a new one or tack down a thin, straight strip of wood to act as a guide in placing the tile.

**Table 6-1.—Estimating Adhesive for Floor Tile**

| ADHESIVE FOR FLOOR TILE | |
|---|---|
| **Type and Use** | **Approximate Coverage in sq. ft. Per Gallon** |
| **Primer**—For treating on or below grade concrete subfloors before installing asphalt tile | 250 to 350 |
| **Asphalt cement**—For installing asphalt tile over primed concrete subfloors in direct contact with the ground | 200 |
| **Emulsion adhesive**—For installing asphalt tile over lining felt | 130 to 150 |
| **Lining paste**—For cementing lining felt to wood subfloor | 160 |
| **Floor and wall sealer**—For priming chalky or dusty suspended concrete subfloors before installing resilient tile other than asphalt | 200 to 300 |
| **Waterproof cement**—Recommended for installing linoleum, rubber, and cork tile over any type of suspended subfloor in areas where surface moisture is a problem | 130 to 150 |

Butt each tile squarely to the adjoining tile, with the comers in line. Carefully lay each tile in place. Do not slide the tile; this causes the adhesive to work up between the joints and prevents a tight fit. Take sufficient time to position each tile correctly. There is usually no hurry since most adhesives can be "worked' over a period of several hours.

To remove air bubbles, rubber, vinyl, and linoleum are usually rolled after a section of the floor is laid. Be sure to follow the manufacturer's recommendations. Asphalt tile does not need to be rolled.

After the main area is complete, set the border tile as a separate operation. To lay out a border tile, place a loose tile (the one that will be cut and used) over the last tile in the outside row. Now, take another tile and place it in position against the wall and mark a sharp pencil line on the first tile (fig. 6-10).

Cut the tile along the marked line, using heavy-duty shears or tin snips. Some types of tile require a special cutter or they may be scribed and broken. Asphalt tile, if heated, can be easily cut with snips.

Afler all sections of the floor have been completed, install the cove along the wall and around fixtures. A special adhesive is available for this operation. Cut the proper lengths and make a trial fit. Apply the adhesive to the cove base and press it into place.

Check the completed installation carefully. Remove any spots of adhesive. Work carefully using cleaners and procedures approved by the manufacturer.

**SELF-ADHERING TILE.—** Before installing self-adhering tile, you must first ensure that the floors are dry, smooth, and completely free of wax, grease, and dirt. Generally, tiles can be laid over smooth-faced resilient floors. Embossed floors, urethane floors, or cushioned floors should be removed.

Self-adhering tile is installed in basically the same way as previously mentioned types of tile. Remove the paper from the back of the tile, place the tile in position on the floor, and press it down.

**Table 6-2.—Estimating Floor Tile**

| | NUMBER OF TILES | |
|---|---|---|
| SQ. FT. OF FLOOR | 9" × 9" | 12" × 12" |
| 1 | 2 | 1 |
| 2 | 4 | 2 |
| 3 | 6 | 3 |
| 4 | 8 | 4 |
| 5 | 9 | 5 |
| 6 | 11 | 6 |
| 7 | 13 | 7 |
| 8 | 15 | 8 |
| 9 | 16 | 9 |
| 10 | 18 | 10 |
| 20 | 36 | 20 |
| 30 | 54 | 30 |
| 40 | 72 | 40 |
| 50 | 89 | 50 |
| 60 | 107 | 60 |
| 70 | 125 | 70 |
| 80 | 143 | 80 |
| 90 | 160 | 90 |
| 100 | 178 | 100 |
| 200 | 356 | 200 |
| 300 | 534 | 300 |
| 400 | 712 | 400 |
| 500 | 890 | 500 |
| **Waste Tile** | | |
| 1 to 50 sq. ft | | 14% |
| 50 to 100 sq. ft | | 10% |
| 100 to 200 sq. ft | | 8% |
| 200 to 300 sq. ft | | 7% |
| 300 to 1,000 sq. ft | | 5% |
| Over 1,000 sq. ft | | 3% |

## Estimating Floor Tile Materials

Use table 6-1 when estimating resilient floor tile materials. This table gives you approximate square feet coverage per gallon of different types of primer and adhesives. Be sure to read and follow the manufacturer's directions. Table 6-2 provides figures for estimating the two sizes of tile most commonly used. After calculating the square feet of the area to be tiled, refer to the table to find the number of tiles needed, then add the waste factor.

To find the number of tiles required for an area not shown in this table, such as the number of 9- by 9-inch tiles required for an area of 550 square feet, add the number of tiles needed for 50 square feet to the number of tile needed for 500 square feet. The result will be 979 tiles, to which you must add 5 percent for waste. The total number of tiles required is 1,028.

When tiling large areas, work from several different boxes of tile. This will avoid concentrating one color shade variation in one area of the floor.

## SHEET VINYL FLOORING

Because of its flexibility, vinyl flooring is very easy to install. Since sheets are available in 6- to 12-foot widths, many installations can be made free of seams. Flexible vinyl flooring is fastened down only around the edges and at seams. It can be installed over concrete, plywood, or old linoleum.

To install, spread the sheet smoothly over the floor. Let excess material turn up around the edges of the room. Where there are seams, carefully match the pattern. Fasten the two sections to the floor with adhesive. Trim the edges to size by creasing the vinyl sheet material at intersections of the floor and walls and cutting it with a utility knife drawn along a straightedge. Be sure the straightedge is parallel to the wall.

After the edges are trimmed and fitted, secure them with a staple gun, or use a band of double-faced adhesive tape. Always study the manufacturer's directions carefully before starting the work.

## WALL-TO-WALL CARPETING

Wall-to-wall carpeting can make a small room look larger, insulate against drafty floors, and do a certain amount of soundproofing. Carpeting is not difficult to install.

All carpets consist of a surface pile and backing. The surface pile may be nylon, polyester, polypropylene, acrylic, wool, or cotton. Each has its advantages and disadvantages. The type you select depends on your needs. Carpeting can be purchased in 9-, 12-, and 15-foot widths.

### Measuring and Estimating

Measure the room in the direction in which the carpet will be hid. To broaden long, narrow rooms, lay patterned or striped carpeting across the width. For conventional y rectangular rooms, measure the room lengthwise. Include the full width of doorframes so the carpet will extend slightly into the adjoining room. When measuring a room with alcoves or numerous wall projections, calculate on the basis of the widest and longest points. This will result in some waste material, but is safer than ordering less than what you need.

Most wall-to-wall carpeting is priced by the square yard. To determine how many square yards you need, multiply the length by the width of the room in feet and divide the result by 9.

### Underpayment

Except for so-called "one-piece" and cushion-backed carpeting, underpayment or padding is essential to a good carpet installation. It prolongs the life of the carpeting, increases its soundproofing qualities, and adds to underfoot comfort.

The most common types of carpet padding are latex (rubber), sponge-rubber foams, soft-and-hardback vinyl foams, and felted cushions made of animal hair or of a combination of hair and jute. Of all types, the latex and vinyl foams are generally considered the most practical. Their waffled surface tends to hold the carpet in place. Most carpet padding comes in a standard 4 1/2-foot width.

Cushion-backed carpeting is increasing in popularity, especially with do-it-yourself homeowners. The high-density latex backing is permanently fastened to the carpet, which eliminates the need for a separate underpadding. It is nonskid and heavy enough to hold the carpet in place without the use of tacks. In addition, the foam rubber backing keeps the edges of the carpet from unraveling so that it need not be bound. Foam rubber is mildewproof and unaffected by water, so the carpet can be used in basements and other below-grade installations. It can even be laid directly over unfinished concrete.

The key feature of this backing, however, is the dimensional stability it imparts to the carpet. This added characteristic means the carpet will not stretch, nor will it expand and contract from temperature or humidity changes. Because of this, these carpets can be loose-laid, with no need for adhesive or tacks to give them stability.

### Preparing the Floor

To lay carpets successfully on wood floors, you must ensure that the surface is free of warps, and that all nails and tacks are either removed or hammered flush. Nail down any loose floorboards and plane down the ridges of warped boards. Fill wide cracks between floorboards with strips of wood or wood putty. Cover floors that are warped and cracked beyond reasonable repair with hardboard or plywood.

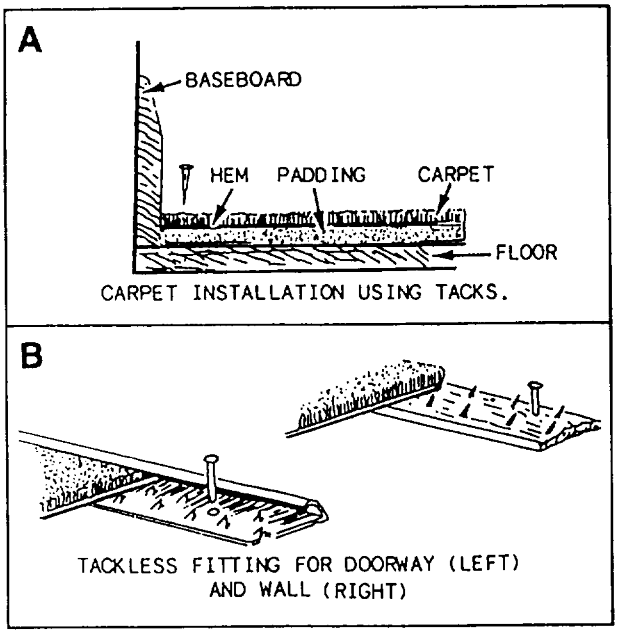



**Figure 6-11.—Carpet installation.**

Stone or concrete floors that have surface ridges or cracks should be treated beforehand with a floor-leveling compound to reduce carpet wear. These liquid compounds are also useful for sealing the surface of dusty or powdery floors. A thin layer of the compound, which is floated over the floor, will keep dust from working its way up through the underpayment and into the carpet pile.

The best carpeting for concrete and hard tile surfaces is the indoor-outdoor type. The backing of this carpet is made of a closed-pore type of either latex or vinyl foam, which keeps out most moisture. It is not wise to lay any of the standard paddings on top of floor tiles unless the room is well ventilated and free of condensation. Vinyl and asbestos floor tiles accumulate moisture when carpeting is laid over them. This condensation soaks through into the carpet and eventually causes a musty odor. It can also produce mildew stains.

### Fastening Carpets

The standard fastening methods are with tacks or by means of tackless fittings. Carpets can also be loose-hid with only a few tacks at entrances. Carpet tack lengths are 3/4 and 1 inch. The first is long enough to go through a folded carpet hem and anchor it firmly to the floor (fig. 6-11, view A). The 1-inch tacks are used in corners where the folds of the hem make three thicknesses.

Tackless fittings (fig. 6-11, view B) are a convenient fastening method. They consist of a 4-foot wooden batten with a number of spikes projecting at a 60° angle. The battens are nailed to the floor around the entire room, end to end and 1/4 inch from the baseboard, with the spikes facing toward the wall. The spikes grip the backing of the carpet to hold it in place. On stone or concrete floors, the battens are glued in place with special adhesives.

Though cushion-backed carpeting can stay in place without fastening, securing with double-face tape is the preferred method. Carpets can also be attached to the floor with Velcro™ tape where the frequent removability of the carpet for cleaning and maintenance is a factor.

### Carpet Installation

To install a carpet, you will need a hammer, large scissors, a sharp knife, a 3-foot rule, needle and carpet thread, chalk and chalk line, latex adhesive, and carpet tape. The only specialized tool you will need is a carpet stretcher, often called a knee-kicker.

Before starting the job, remove all furniture and any doors that swing into the room. When cutting the carpet, spread it out on a suitable floor space and chalk the exact pattern of the room on the pile surface; then cut along the chalk line with the scissors or sharp knife.

Join unseamed carpet by placing the two pieces so the pile surfaces meet edge to edge. Match patterned carpets carefully. With plain carpets, lay each piece so the piles run the same way. Join the pieces with carpet thread, taking stitches at 18-inch intervals along the seam. Pull the carpet tight after each stitch to take up slack. Sew along the seam between stitches. Tuck any protruding fibers back into the pile. Carpet can also be seamed by cementing carpet tape to the backing threads with latex adhesive.

Open the carpet to room length and position it before starting to putdown the padding. The pile should fall away from windows to avoid uneven shading in daylight. Fold one end of the carpet back halfway and put the padding down on the exposed part of the floor. Do the same at the other end. This avoids wrinkles caused by movement of the padding.

To tack start at the corner of the room that is formed by the two walls with the fewest obstructions. Butt the carpet up against the wall, leaving about 1 1/2 inches up the baseboard for hemming. Attach the carpet temporarily with tacks about 6 inches from the baseboard along these two walls. Use the knee-kicker to stretch the carpet, first along the length, then the width, Start from the middle of the wall, stretching alternately toward opposite comers. When it is smooth, tack down the stretched area temporarily.

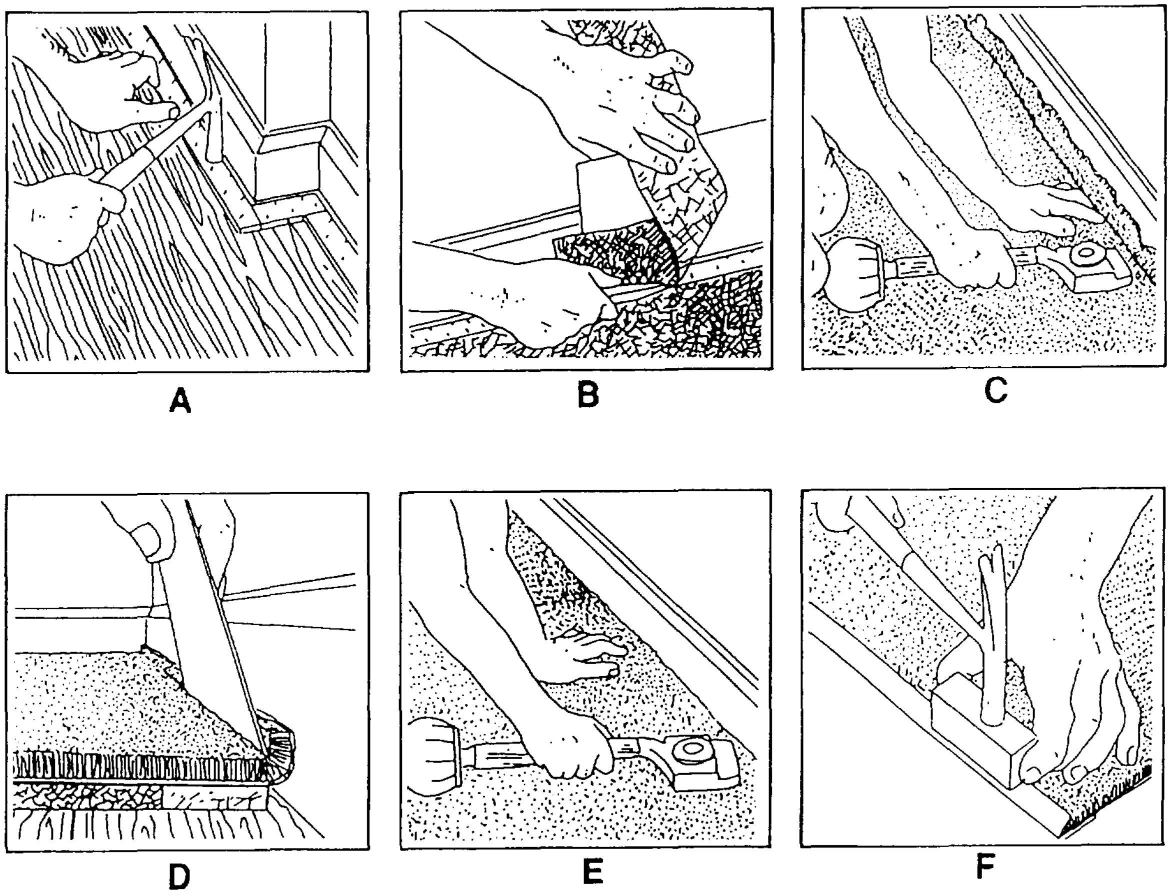



**Figure 6-12.—Carpet installation using tackless fastenings.**

Cut slots for pipes, fireplace protrusions, and radiators. Trim back the padding to about 2 inches from the wall to leave a channel for the carpet hem. Fold the hem under and tack the carpet in place with a tack every 5 inches. Be sure the tacks go through the fold

When installing carpet, use tackless fastening strips, as shown in figure 6-12, view A. Position and trim the padding (view B) so that it meets the strip at the wall, but does not overlap the strip. Tack it down so it does not move. Lay out the carpeting and, using a knee-kicker, stretch the carpet over the nails projecting out of the tackless strip (view C). Trim the carpet, leaving a 3/8-inch overlap, which is tucked into place between the wall and the tackless strip (view D). (If you trim too much carpeting, lift the carpeting off the spikes of the tackless strip and use the knee-kicker to restretch the carpet [view E]). Protect the exposed edge of the carpet at doorways with a special metal binder strip or bar (view F). The strip is nailed to the floor at the doorway and the carpet slipped under a metal lip, which is then hammered down to grip the carpet edge.

Tacks can be used as an alternative to a binder strip. Before tacking, tape the exposed edge of woven carpet to prevent fraying if the salvage has been trimmed off. Cement carpet tape to the backing threads with latex adhesive. Nonwoven or latex-backed carpet will not fray, but tape is still advisable to protect exposed edges. Any door that drags should be removed and trimmed.

When installing cushion-backed carpeting, you cart eliminate several steps. For instance, you don't need to use tack strips or a separate padding. Although these instructions apply to most such carpeting, read the manufacturer's instructions for any deviation in technique or use of material.

To install a cushioned carpet, apply 2-inch-wide double-face tape flush with the wall around the entire room (fig. 6-13, view A). Roll out and place the carpet. Fold back the carpet and remove the protective paper from the tape. Press the carpet down firmly over the tape and trim away excess (view B). A metal binder strip or an aluminum saddle is generally installed in doorways (view C). If your room is wider than the carpet, you will have to seam two pieces together. Follow the manufacturer's recommendations.

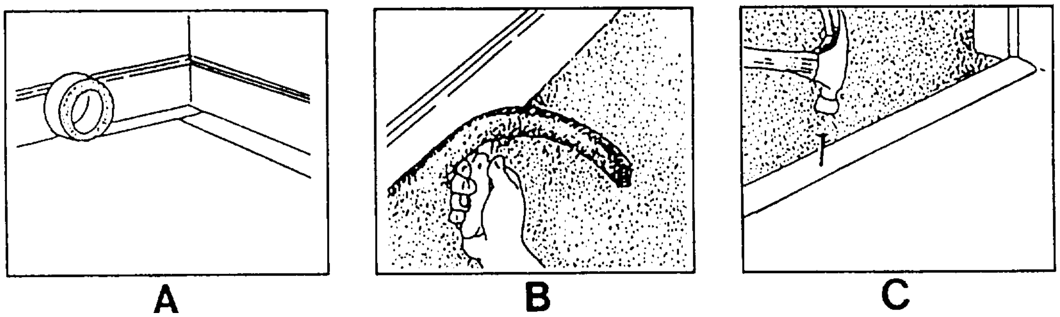



**Figure 6-13.—Installing cushion-backed carpeting.**

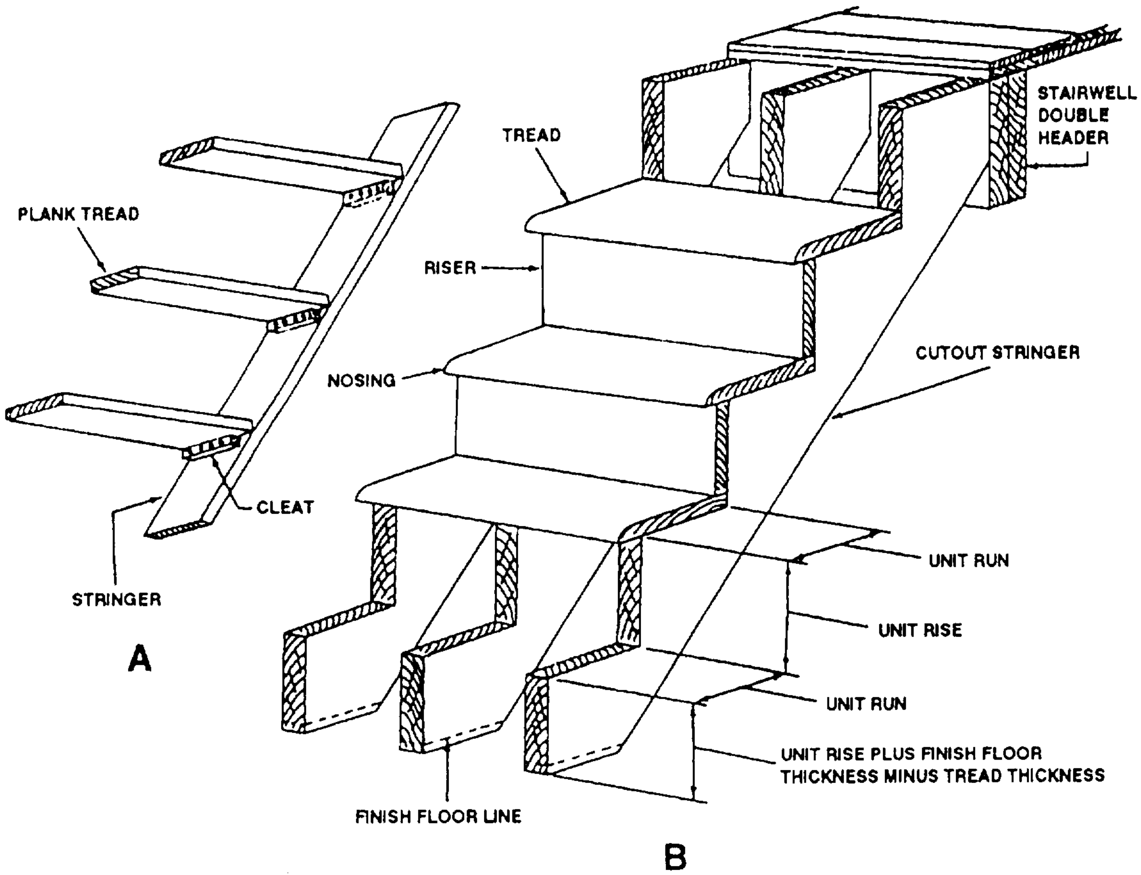



**Figure 6-14.—Stairways.**

## STAIRS

*LEARNING OBJECTIVE: Upon completing this section, you should be able to describe a stairway layout and how to frame stairs according to drawings and specifications.*

There are many different kinds of stairs (interior and exterior), each serving the same purpose—the movement of personnel and products from one floor to another. All stairs have two main parts, called treads and stringers. The underside of a simple stairway, consisting only of stringers and treads, is shown in figure 6-14, view A. Treads of the type shown are called plank treads. This simple type of stairway is called a cleat stairway because of the cleats attached to the stringers to support the treads.

A more finished type of stairway has the treads mounted on two or more sawtooth-edged stringers, and includes risers (fig. 6-14, view B). The stringers shown

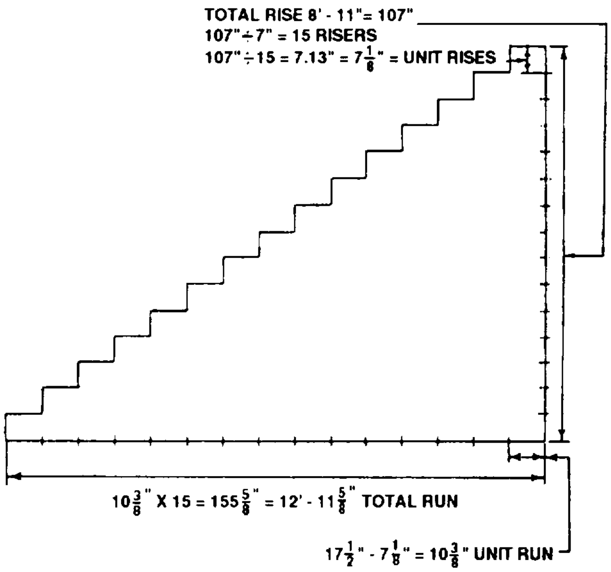



**Figure 6-15.—Unit rise and run.**

are cut from solid pieces of dimensional lumber (usually 2 by 12s) and are called cutout, or sawed, stringers.

## STAIRWAY LAYOUT

The first step in stairway layout is to determine the unit rise and unit run (fig. 6-14, view B). The unit rise is calculated on the basis of the total rise of the stairway, and the fact that the customary unit rise for stairs is 7 inches.

The total rise is the vertical distance between the lower finish-floor level and the upper finish-floor level. This may be shown in the elevations. However, since the actual vertical distance as constructed may vary slightly from that shown in the plans, the distance should be measured.

At the time stairs are laid out, only the subflooring is installed. If both the lower and the upper floors are to be covered with finish flooring of the same thickness, the measured vertical distance from the lower subfloor surface to the upper subfloor surface will be the same as the eventual distance between the finish floor surfaces. The distance is, therefore, equal to the total rise of the stairway. But if you are measuring up from a finish floor, such as a concrete basement floor, then you must add to the measured distance the thickness of the upper finish flooring to get the total rise of the stairway. If the upper and lower finish floors will be of different thickness, then you must add the difference in thickness to the measured distance between subfloor surfaces to get the rise of the stairway. To measure the vertical distance, use a straight piece of lumber plumbed in the stair opening with a spirit level.

Let's assume that the total rise measures 8 feet 11 inches, as shown in figure 6-15. Knowing this, you can determine the unit rise as follows. First, reduce the total rise to inches-in this case it comes to 107 inches. Next, divide the total rise in inches by the average unit rise, which is 7 inches. The result, disregarding any fraction, is the number of risers the stairway will have—in this case, 107/7 or 15. Now, divide the total rise in inches by the number of risers-in this case, 107/15, or nearly 7 1/8 inches. This is the unit rise, as shown in figure 6-15.

The unit run is calculated on the basis of the unit rise and a general architect's rule that the sum of the unit run and unit rise should be 17 1/2 inches. Then, by this rule, the unit run is 17 1/2 inches minus 7 1/8 inches or 10 3/8 inches.

You can now calculate the total run of the stairway. The total run is the unit run multiplied by the total number of treads in the stairway. However, the total number of treads depends upon the manner in which the upper end of the stairway will be anchored to the header.

In figure 6-16, three methods of anchoring the upper end of a stairway are shown. In view A, there is a complete tread at the top of the stairway. This means the number of complete treads is the same as the number of

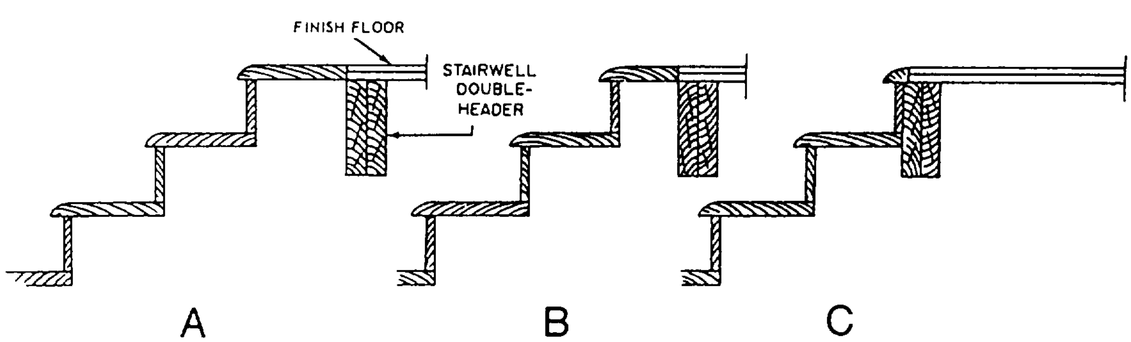



**Figure 6.16.—Method for anchoring upper end of a stairway.**

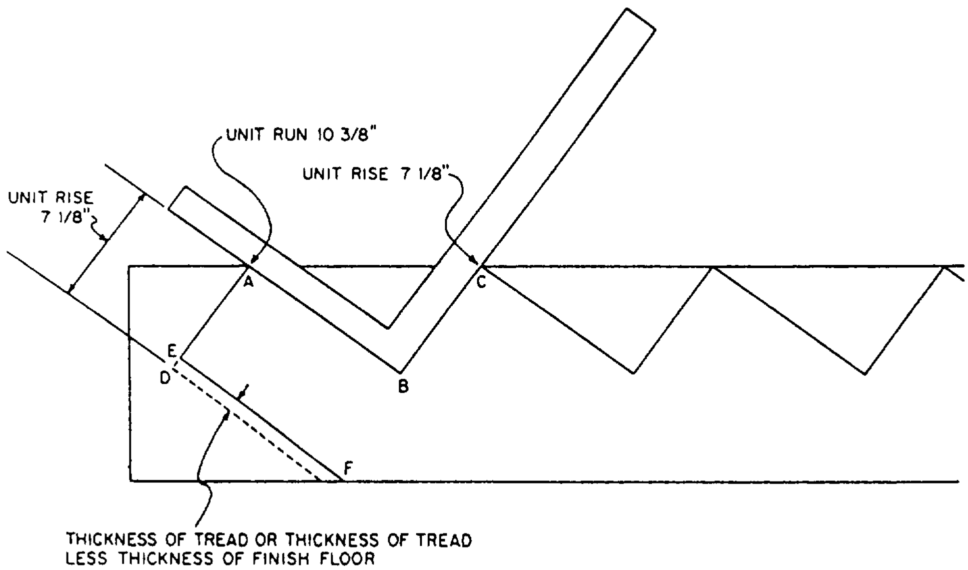



**Figure 6-17.—Layout of lower end of cutout stringer.**

risers. For the stairway shown in figure 6-15, there are 15 risers and 15 complete treads. Therefore, the total run of the stairway is equal to the unit run times 15, or 12 feet 11 5/8 inches.

In view B, only part of a tread is at the top of the stairway. If this method were used for the stairway shown in figure 6-15, the number of complete treads would be one less than the number of risers, or 14, The total run of the stairway would be the product of 14 multiplied by 10 3/8, plus the run of the partial tread at the top. Where this run is 7 inches, for example, the total run equals 152 1/4 inches, or 12 feet 8 1/4 inches.

In view C, there is no tread at all at the top of the stairway. The upper finish flooring serves as the top tread. In this case, the total number of complete treads is again 14, but since there is no additional partial tread, the total run of the stairway is 14 times 10 3/8 inches, or 145 1/4 inches, or 12 feet 1 1/4 inches.

When you have calculated the total run of the stairway, drop a plumb bob from the header to the floor below and measure off the total run from the plumb bob. This locates the anchoring point for the lower end of the stairway.

As mentioned earlier, cutout stringers for main stairways are usually made from 2 by 12 stock Before cutting the stringer, you will first need to solve for the length of stock you need.

Assume that you are to use the method of upper-end anchorage shown in view A of figure 6-16 to lay out a stringer for the stairway shown in figure 6-15. This stairway has a total rise of 8 feet 11 inches and a total run of 12 feet 11 5/8 inches. The stringer must be long enough to form the hypotenuse of a triangle with sides of those two lengths. For an approximate length estimate, call the sides 9 and 13 feet long. Then, the length of the hypotenuse will equal the square root of $9^2$ plus $13^2$. This is the square root of 250, about 15.8 feet or 15 feet 9 1/2 inches.

Extreme accuracy is required in laying out the stringers. Be sure to use a sharp pencil or awl and make the lines meet on the edge of the stringer material.

Figure 6-17 shows the layout at the lower end of the stringer. Set the framing square to the unit run on the tongue and the unit rise on the blade, and draw the line AB. This line represents the bottom tread. Then, draw AD perpendicular to AB. Its length should be equal to the unit rise. This line represents the bottom riser in the stairway. You may have noticed that the thickness of a tread in the stairway has been ignored. This thickness is now about to be accounted for by making an allowance in the height of this first riser. This process is called "dropping the stringer."

As you can see in figure 6-14, view B, the unit rise is measured from the top of one tread to the top of the next for all risers except the bottom one. For the bottom riser, unit rise is measured from the finished floor surface to the surface of the first tread. If AD were cut to the unit rise, the actual rise of the first step would be the sum of the unit rise plus the thickness of a tread. Therefore, the length of AD is shortened by the thickness of a tread, as shown in figure 6-17, by the

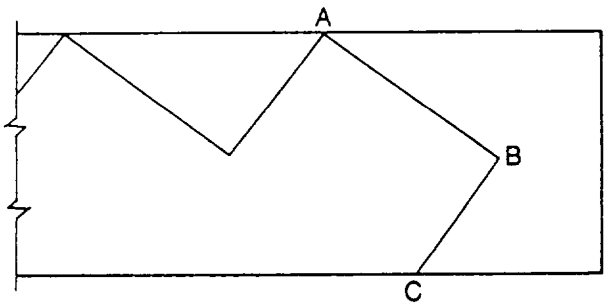



**Figure 6-18.—Layout of upper end of cutout stringer.**

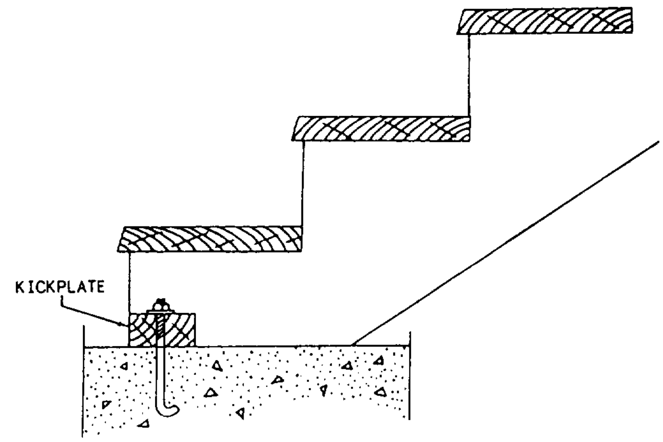



**Figure 6-19.—Kickplate for anchoring stairs to concrete.**

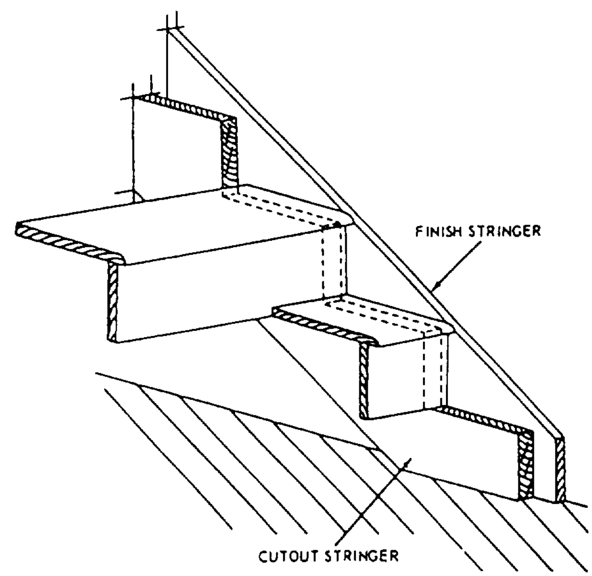



**Figure 6-20.—Finish stringer.**

thickness of a tread less the thickness of the finish flooring. The first is done if the stringer rests on a finish floor, such as a concrete basement floor. The second is done where the stringer rests on subflooring.

When you have shortened AD to AE, draw EF parallel to AB. This line represents the bottom horizontal anchor edge of the stringer. Then, proceed to lay off the remaining risers and treads to the unit rise and unit run until you have laid off 15 risers and 15 treads. Figure 6-18 shows the layout at the upper end of the stringer. The line AB represents the top, the 15th tread. BC, drawn perpendicular to AB, represents the upper vertical anchor edge of the stringer. This edge butts against the stairwell header.

In a given run of stairs, be sure to make all the risers the same height and treads the same width. An unequal riser, especially one that is too high, is dangerous.

## STAIRWAY CONSTRUCTION

We have been dealing with a common straight-flight stairway—meaning one which follows the same direction throughout. When floor space is not extensive enough to permit construction of a straight-flight stairway, a change stairway is installed-meaning one which changes direction one or more times. The most common types of these are a 90° change and a 180° change. These are usually platform stairways, successive straight-flight lengths, connecting platforms at which the direction changes 90° or doubles back 180°. Such a stairway is laid out simply as a succession of straight-flight stairways.

The stairs in a structure are broadly divided into principal stairs and service stairs. Service stairs are porch, basement, and attic stairs. Some of these maybe simple cleat stairways; others may be open-riser stairways. An open-riser stairway has treads anchored on cutout stringers or stair-block stringers, but no risers. The lower ends of the stringers on porch, basement, and other stairs anchored on concrete are fastened with a kickplate (shown in fig. 6-19).

When dealing with stairs, it is vitally important to remember the allowable head room. Head room is defined as the minimum vertical clearance required from any tread on the stairway to any part of the ceiling structure above the stairway. In most areas, the local building codes specify a height of 6 feet 8 inches for main stairs, and 6 feet 4 inches for basement stairs.

A principal stairway usually has a finished appearance. Rough cutout stringers are concealed by

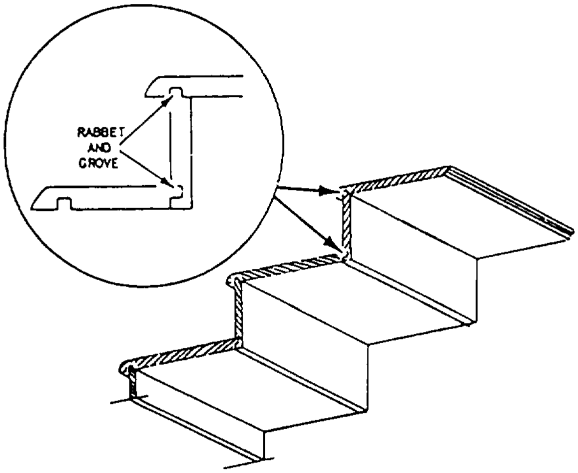



**Figure 6-21.—Rabbet-and-groove-jointed treads and risers.**

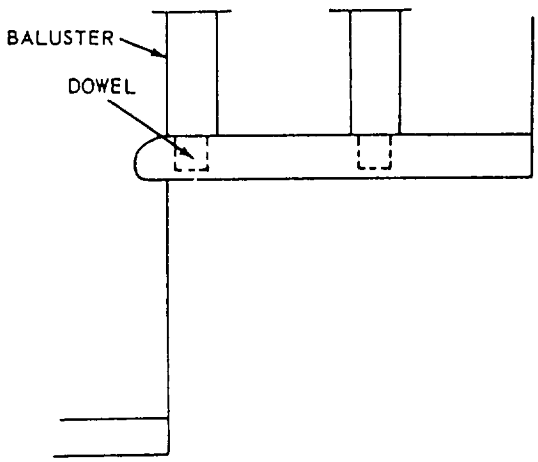



**Figure 6-22.—Joining a baluster to the tread.**

finish stringers (see fig. 6-20). Treads and risers are often rabbet-jointed as in figure 6-21.

Vertical members that support a stairway handrail are called balusters. Figure 6-22 shows a method of joining balusters to treads. Here, dowels, shaped on the lower ends of the balusters, are glued into holes bored in the treads.

Stringers should be toenailed to stairwell double headers with 10d nails, three to each side of the stringer. Those which face against trimmer joists should each be nailed to the joists with at least three 16d nails. At the bottom, a stringer should be toenailed with 10d nails, four to each side, driven into the subflooring and, if possible, into a joist below.

Treads and risers should be nailed to stringers with 6d, 8d, or 10d finish nails, depending on the thickness of the stock,

## INTERIOR DOORFRAMING

*LEARNING OBJECTIVE: Upon completing this section, you should be able to describe the procedures for laying out and installing interior dooframes, doors, and the hardware used.*

Rough openings for interior doors are usually framed to be 3 inches higher than the door height and 2 1/2 inches wider than the door width. This provides for the frame and its plumbing and leveling in the opening. Interior doorframes are made up of two side jambs, a head jamb, and the stop moldings upon which the door closes. The most common of these jambs is the one-piece type (shown in fig. 6-23, view A). Jambs can be obtained in standard 5 1/4 inch widths for plaster walls and 4 5/8 inch widths for walls with 1/2-inch drywall finish. The two- and three-piece adjustable jambs (views B and C) are also standard types. Their principal advantage is in being adaptable to a variety of wall thicknesses.

Some manufacturers produce interior doorframes with the doors fitted and prehung, ready for installing. Installation of the casing completes the job. When used with two- or three-piece jambs, casings can even be installed at the factory.

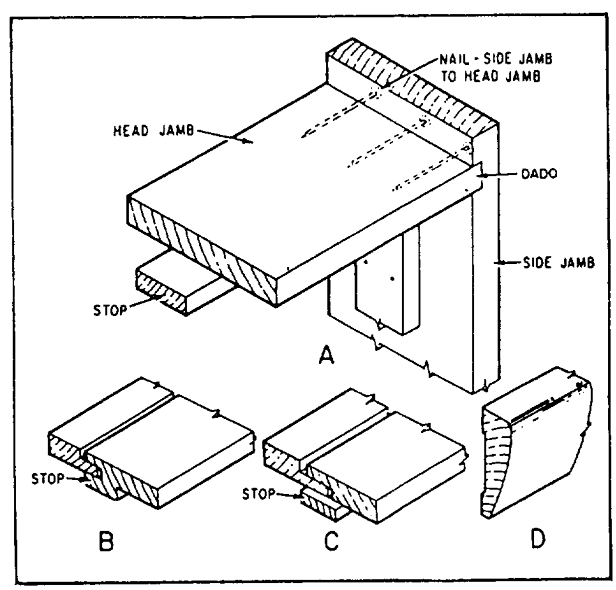
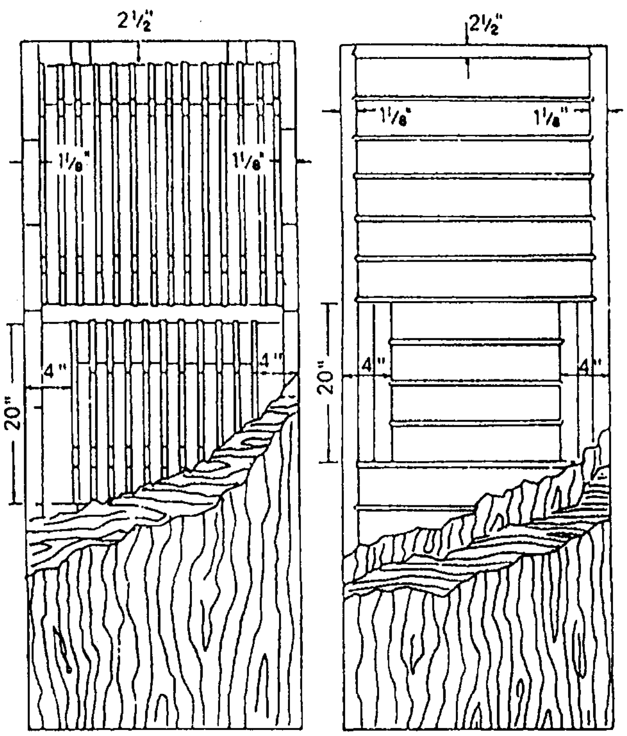



**Figure 6-23.—Interior door framing parts.**




FIVE-PLY HOT PRESS HOLLOW CORE    SEVEN-PLY HOLLOW CORE

**Figure 6-24.—Hollow-core construction of flushed doors.**

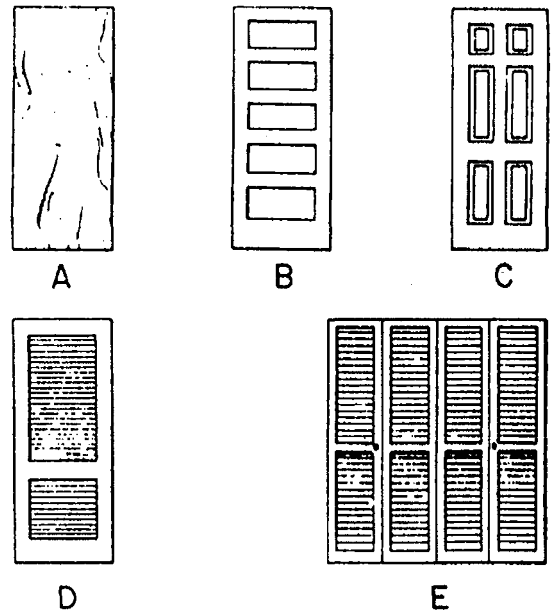



**Figure 6-25.-Interior door types.**

Common minimum widths for single interior doors are as follows: bedrooms and other habitable rooms, 2 feet 6 inches; bathrooms, 2 feet 4 inches; and small closets and linen closets, 2 feet. These sizes vary a great deal, and sliding doors, folding door units, and similar types are often used for wardrobes and may be 6 feet or more in width. However, in most cases, the jamb stop and casing parts are used in some manner to frame and finish the opening.

## CASING

Casing is the edge trim around interior door openings and is also used to finish the room side of windows and exterior doorframes. Casing usually varies in widths from 2 1/4 to 3 1/2 inches, depending on the style. Casing is available in thicknesses from 1/2 to 3/4 inch, although 11/1 6 inch is standard in many of the narrow-line patterns. A common casing pattern is shown in figure 6-23, view D.

The two general types of interior doors are the flush and the panel. Flush interior doors usually have a hollow core of light framework and are faced with thin plywood or hardboard (shown in fig. 6-24). Plywood-faced flush doors (fig. 6-25, view A) maybe obtained in gum, birch, oak mahogany, and several other wood species, most of which are suitable for natural finish. Nonselected grades are usually painted as hardboard-faced doors.

The panel door consists of solid stiles (vertical side members), rails (cross pieces), and panels of various types. The five-cross panel and the colonial-type panel doors are perhaps the most common of this style (fig. 6-25, views B and C). The louvered door (view D) is also popular and is commonly used for closets because it provides some ventilation. Large openings for wardrobes are finished with sliding or folding doors, or with flush or louvered doors (view E). Such doors are usually 1 1/8 inches thick.

Hinged doors should open or swing in the direction of natural entry, against a blank wall whenever possible. They should not be obstructed by other swinging doors. Doors should never be hinged to swing into a hallway.

## FRAME AND TRIM INSTALLATION

When the frame and doors are not assembled and prefitted, the side jambs should be fabricated by nailing through the dado into the head jamb with three 7d or 8d coated nails (fig. 6-23 view A). The assembled frames are then fastened in the rough openings by shingle wedges used between the side jamb and the stud (fig. 6-26, view A). One jamb is plumbed and leveled using four or five sets of shingle wedges for the height of the frame. Two 8d finishing nails should be used at each

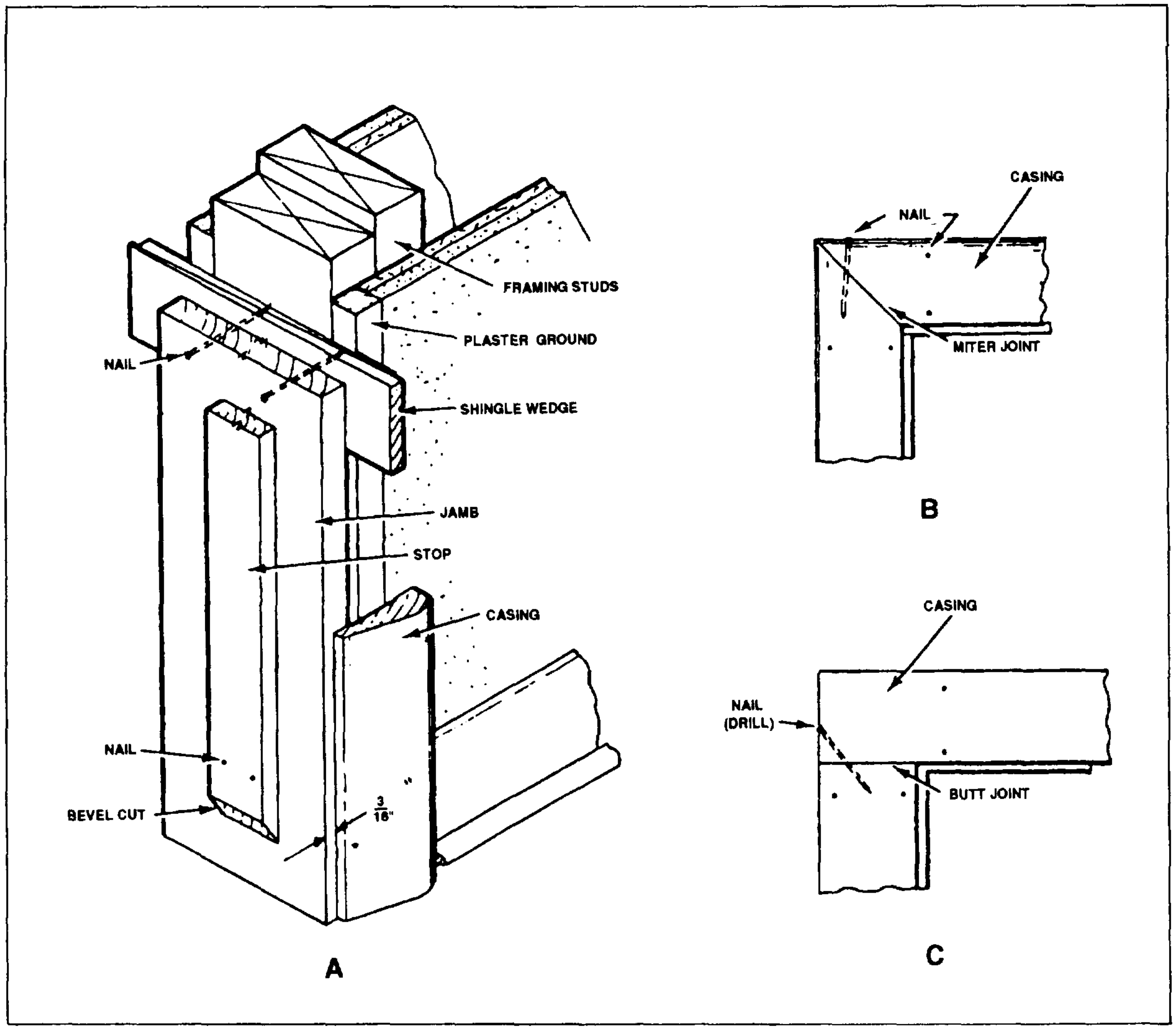



**Figure 6-26.—Doorframe and trim.**

wedged area one driven so that the doorstop covers it. The opposite side jamb is then fastened in place with shingle wedges and finishing nails, using the first jamb as a guide in keeping a uniform width.

Casings should be nailed to both the jamb and the framing members. You should allow about a 3/16-inch edge distance from the face of the jamb. Use 6d or 7d finish or casing nails, depending on the thickness of the casing. To nail into the stud, use 4d or 5d finish nails or 1 1/2-inch brads to fasten the timer edge of the casing to the jamb. For hardwood casing, it is advisable to predrill to prevent splitting. Nails in the casing should be located in pairs and spaced about 16 inches apart along the full height of the opening at the head jamb.

Casing with any form of molded shape must have a mitered joint at the comers (fig. 6-26, view B). When casing is square-edged, a butt joint maybe made at the junction of the side and head casing (fig. 6-26, view C), If the moisture content of the casing material is high, a mitered joint may open slightly at the outer edge as the material dries. This can be minimized by using a small glued spline at the corner of the mitered joint. Actually, use of a spline joint under any moisture condition is considered good practice, and some prefitted jamb, door, and casing units are provided with splined joints. Nailing into the joint after drilling helps retain a close fit.

The door opening is now complete except for fitting and securing the hardware and nailing the stops in proper position. Interior doors are normally hung with two 3 1/2-by 3 1/2-inch loose-pin butt hinges. The door is fitted into the opening with the clearances shown in

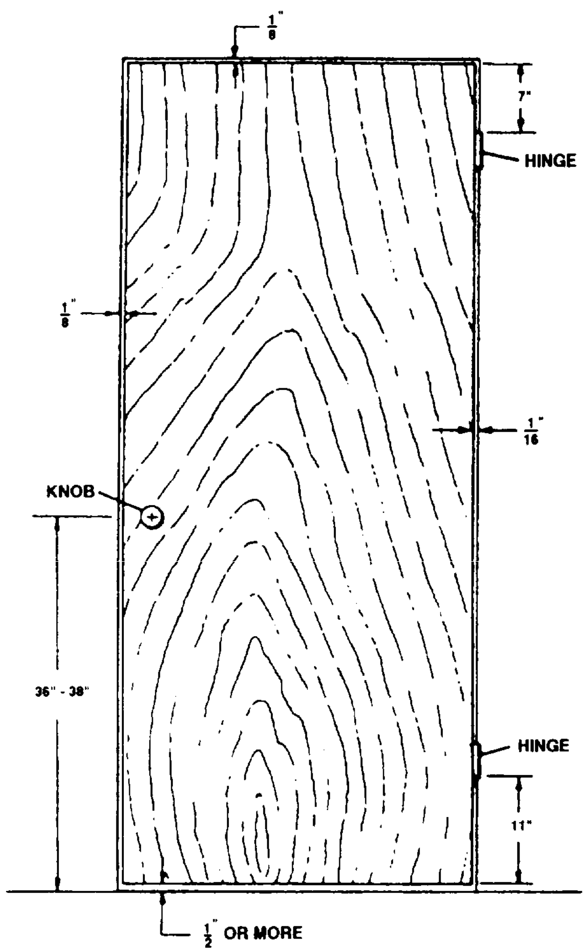



**Figure 6-27.—Door clearances.**

figure 6-27. The clearance and location of hinges, lockset, and doorknob may vary somewhat, but they are generally accepted by craftsmen and conform to most millwork standards. The edge of the lock stile should be beveled slightly to permit the door to clear the jamb when swung open. If the door is to swing across heavy carpeting, the bottom clearance may need to be slightly more.

When fitting doors, you should temporarily nail the stop in place; this stop will be nailed in permanently when the door has been hung. Stops for doors in single-piece jambs are generally 7/16 inch thick and may be 3/4 inch to 2 1/4 inches wide. They are installed with a mitered joint at the junction of the side and head jambs. A 45° bevel cut at the bottom of the stop, about 1 to 1 1/2 inches above the finish floor, eliminates a dirt pocket and makes cleaning or refinishing of the floor easier (fig. 6-26, view A).

Some manufacturers supply prefitted doorjambs and doors with the hinge slots routed and ready for installation. A similar door buck (jamb) of sheet metal with formed stops and casing is also available.

## DOOR HARDWARE INSTALLATION

Hardware for doors is available in a number of finishes, with brass, bronze, and nickel being the most common. Door sets are usually classified as entry lock for interior doors; bathroom set (inside lock control with safety slot for opening from the outside); bedroom lock (keyed lock); and passage set (without lock).

As mentioned earlier, doors should be hinged so that they open in the direction of natural entry. 'hey should also swing against a blank wall whenever possible and never into a hallway. The door swing directions and sizes are usually shown on the working drawings. The "hand of the door" (fig. 6-28) is the expression used to describe the direction in which a door is to swing (normal or reverse) and the side from which it is to hang (left or right).

When ordering hardware for a door, be sure to specify whether it is a left-hand door, a right-hand door, a left-hand reverse door, or a right-hand reverse door.

### Hinges

You should use three hinges for hanging 1 3/4-inch exterior doors and two hinges for the lighter interior doors. The difference in exposure on the opposite sides of exterior doors causes a tendency to warp during the winter. Three hinges reduce this tendency. Three hinges are also useful on doors that lead to unheated attics and for wider and heavier doors that may be used within the structure. If a third hinge is required center it between the top and bottom hinges.

Loose-pin butt hinges should be used and must be of the proper size for the door they support. For 1 3/4-inch-thick doors, use 4- by 4-inch butts; for 1 3/8-inch doors, you should use 3 1/2- by 3 1/2-inch butts. After the door is fitted to the tied opening with the proper clearances, hinge halves are fitted to the door. They are routed into the door edge with about a 3/16-inch back distance (fig. 6-29, view A). One hinge half should be set flush with the surface and must be fastened square with the edge of the door. Screws are included with each pair of hinges.

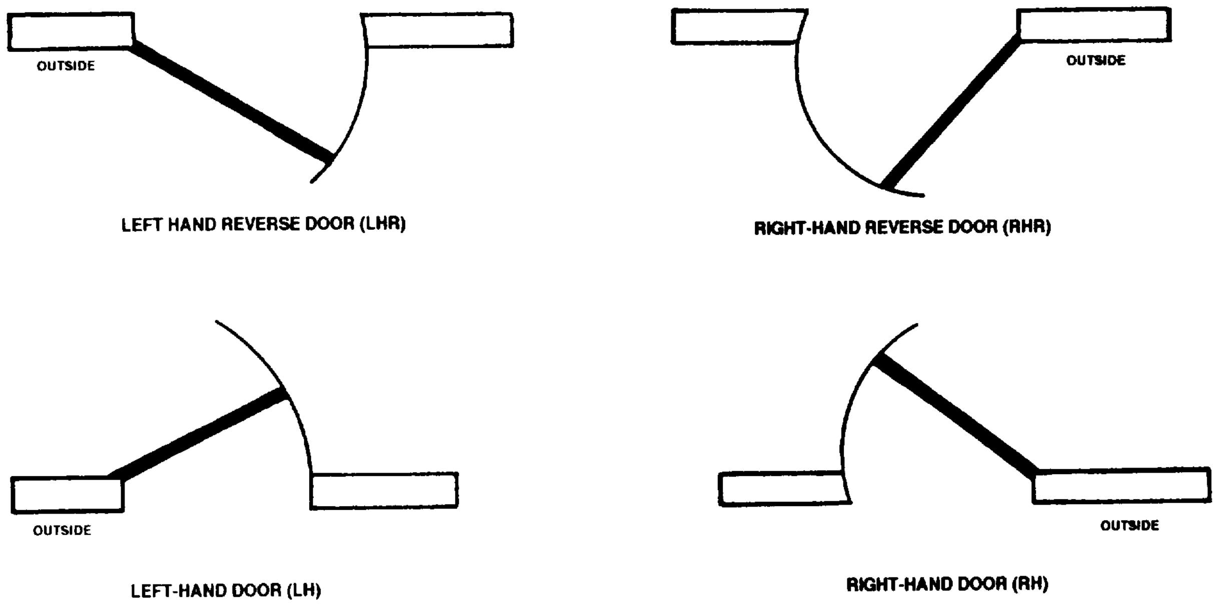



Figure 6-28.—"Hands" of doors.

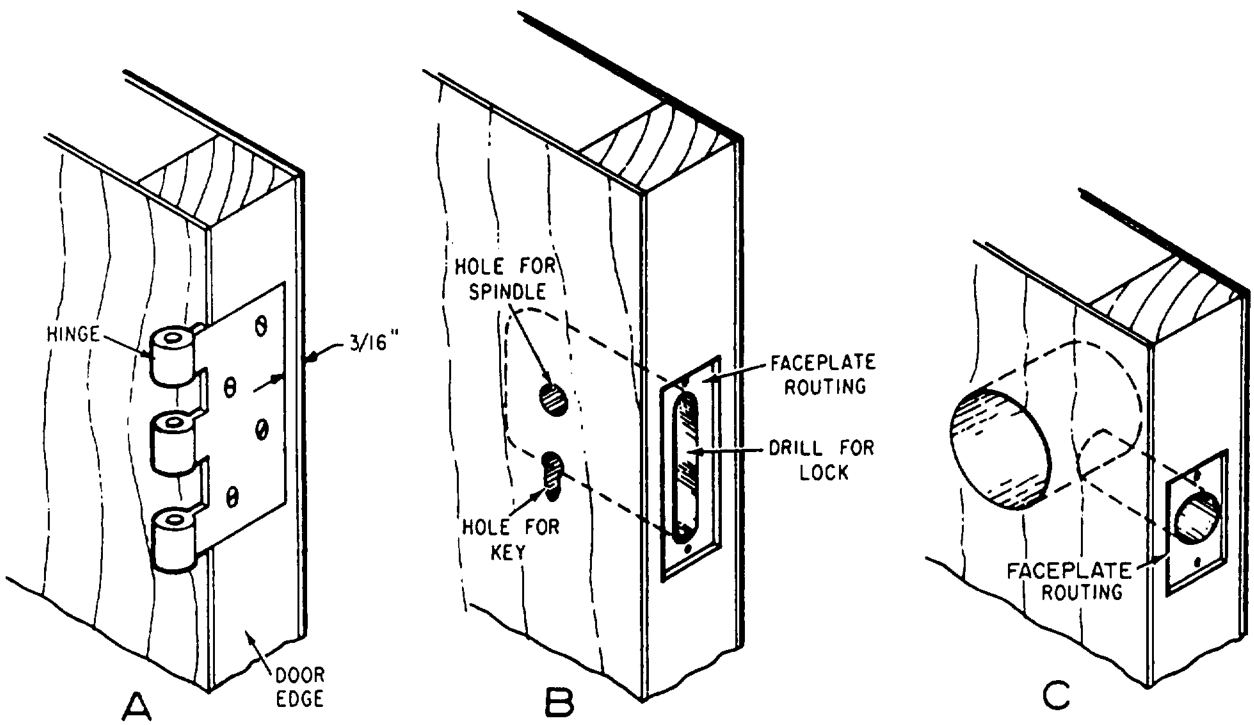



Figure 6-29.—Installation of door hardware.

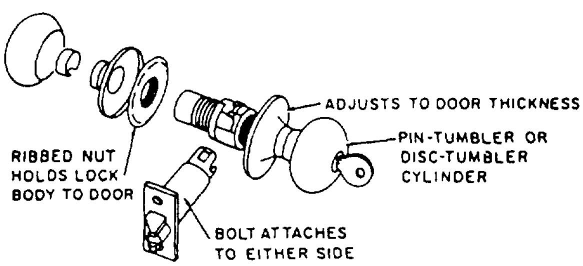



**Figure 6-30.—Parts of a cylinder lock.**

The door should now be placed in the opening and blocked up at the bottom for proper clearance. The jamb should be marked at the hinge locations, and the remaining hinge half routed and fastened in place. The door should then be positioned in the opening and the pins slipped in place. If you have installed the hinges correctly and the jambs are plumb, the door should swing freely.

**Locks**

The types of door locks differ with regard to installation, cost, and the amount of labor required to set them. Some types, such as mortise locks, combination dead bolts, and latch locksets, require drilling of the edge and face of the door and then routing of the edge to accommodate the lockset and faceplate (fig, 6-29, view B). A bored lockset (view C) is easy to install since it requires only one hole drilled in the edge and one in the face of the door. Boring jigs and faceplate markers are available to ensure accurate installation.

The lock should be installed so that the doorknob is 36 to 38 inches above the floor line. Most sets come with paper templates, marking the location of the lock and size of the holes to be drilled. Be sure to read the manufacturer's installation instructions carefully. Recheck your layout measurements before you drill any holes.

The parts of an ordinary cylinder lock for a door are shown in figure 6-30. The procedure for installing a lock of this type is as follows:

1. Open the door to a convenient working position and check it in place with wedges under the bottom near the outer edge.
2. Measure up 36 inches from the floor (the usual knob height), and square a line across the face and edge of the lock stile.
3. Place the template, which is usually supplied with a cylinder lock, on the face of the door at the proper height and alignment with layout lines and mark the centers of the holes to be drilled. (A typical template is shown in fig. 6-31.)

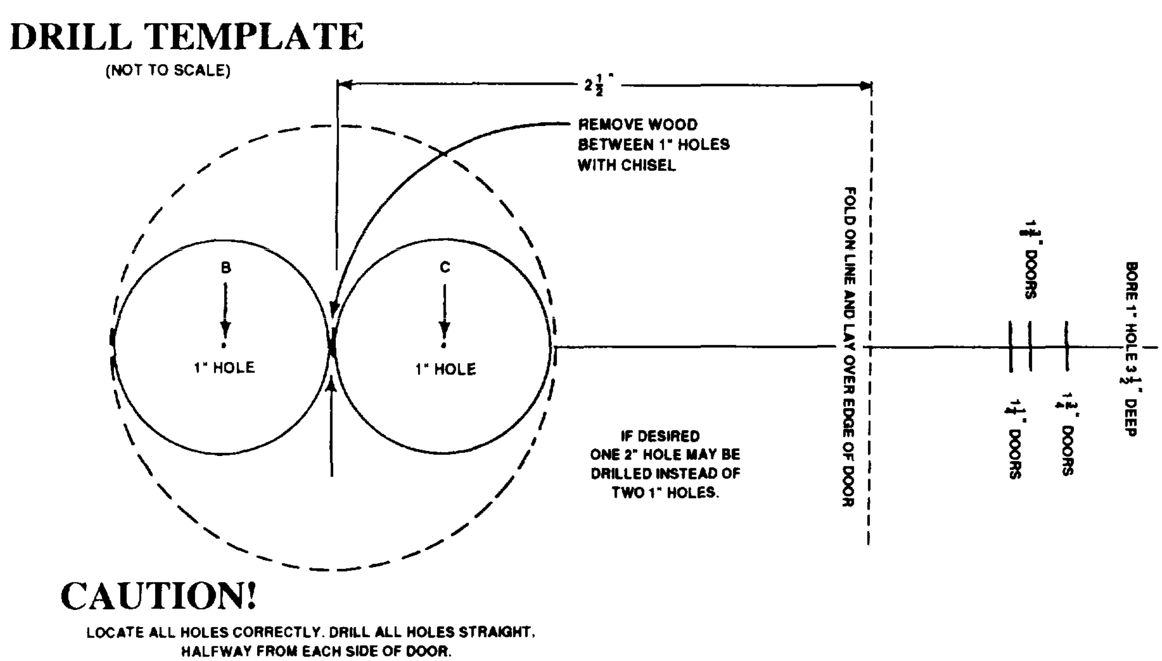



**Figure 6-31.—Drill template for locksets.**

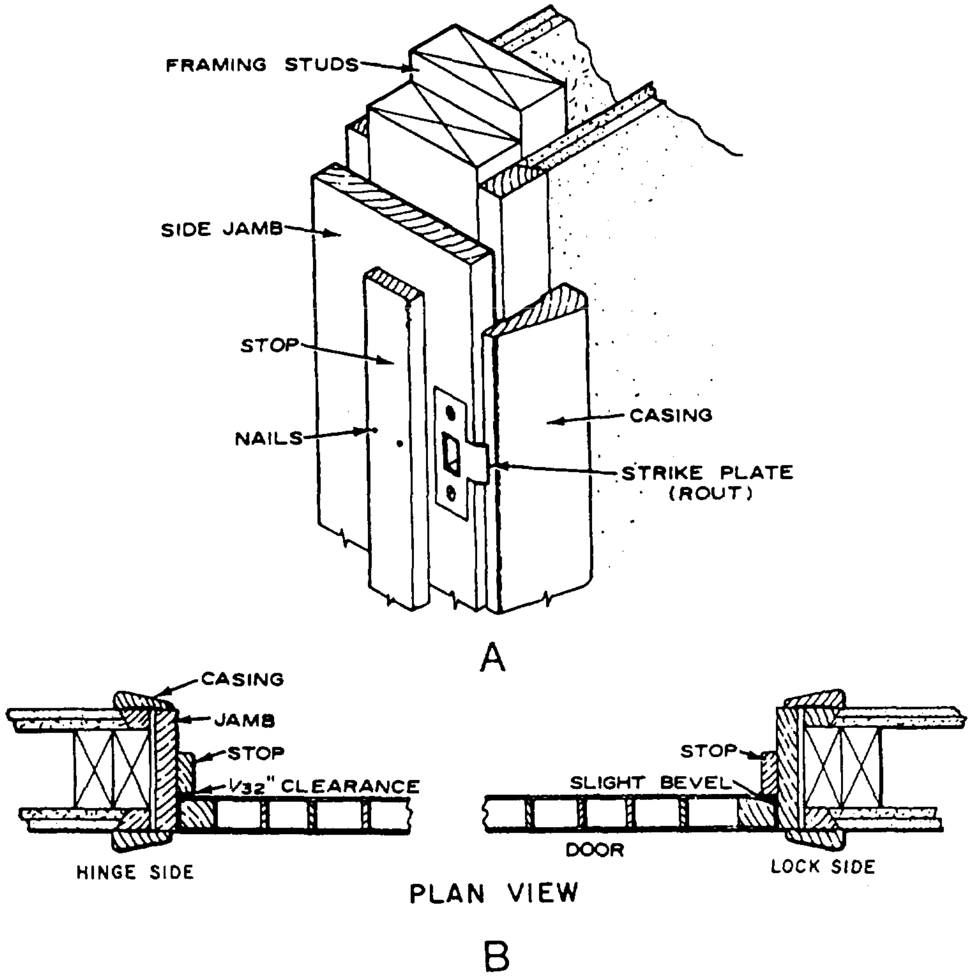



**Figure 6-32.—Door details.**

4. Drill the holes through the face of the door and then the hole through the edge to receive the latch bolt. It should be slightly deeper than the length of the bolt.
5. Cut again for the latch-bolt mounting plate, and install the latch unit.
6. Install the interior and exterior knobs.
7. Find the position of the strike plate and install it in the jamb.

### Strike Plates

The strike plate, which is routed into the doorjamb, holds the door in place by contact with the latch. To install, mark the location of the latch on the doorjamb and locate the position of the strike plate by outlining it. Rout out the marked outline with a chisel and also rout for the latch (fig. 6-32, view A). The strike plate should be flush with or slightly below the face of the doorjamb. When the door is latched, its face should be flush with the edge of the jamb.

### Doorstops

The stops that have been temporarily set during the fitting of the door and the hardware may now be nailed in permanently. You should use finish nails or brads, 1 1/2 inches long. The stop at the lock side (fig. 6-32, view B) should be nailed first, setting it tight against the door face when the door is latched. Space the nails in pairs 16 inches apart.

The stop behind the hinge side should be nailed next, and a 1/32-inch clearance from the door face should be allowed to prevent scraping as the door is opened. The head-jamb stop should then be nailed in place. Remember that when the door and trim are painted, some of the clearance will be taken up.

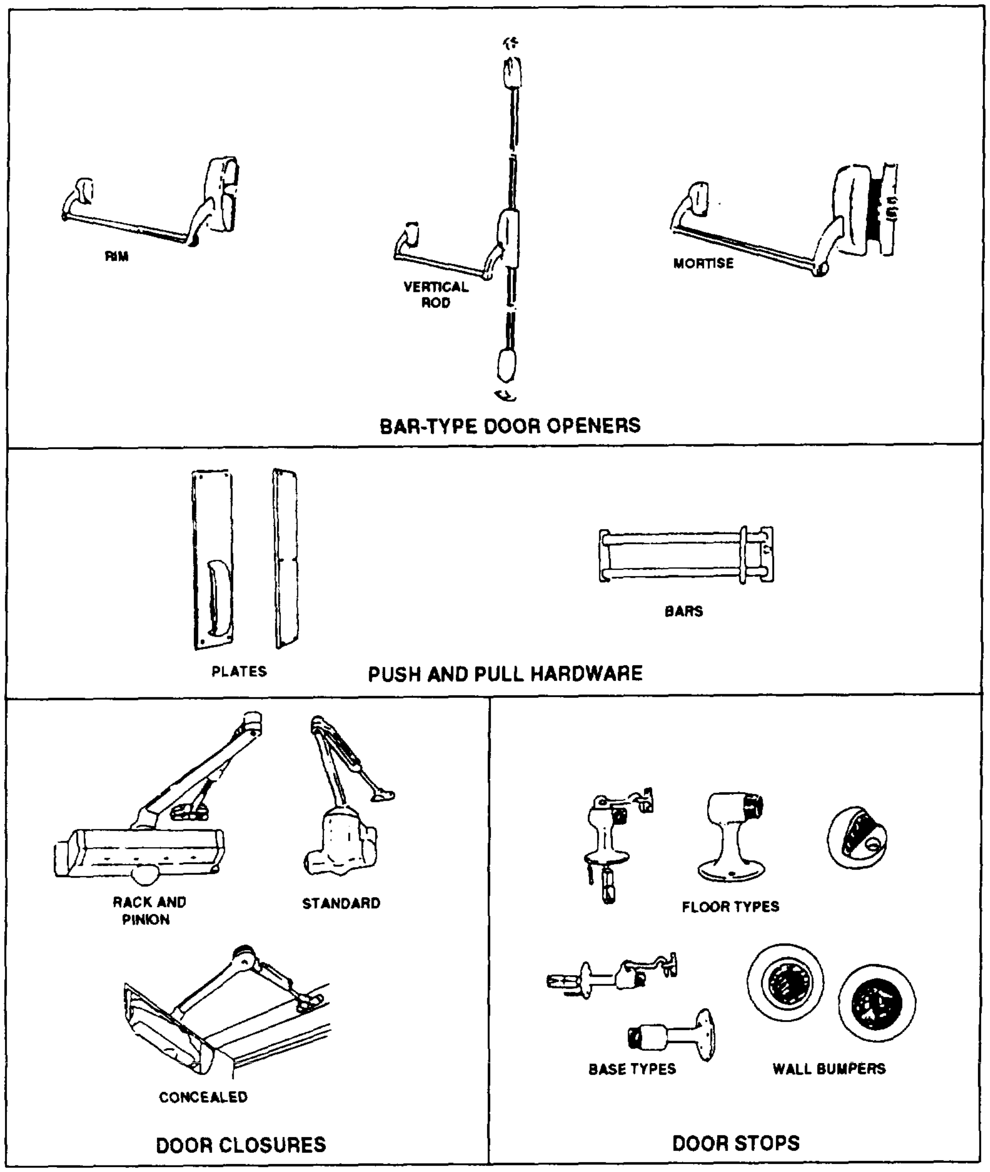



**Figure 6-33.—Commercial hardware.**

## COMMERCIAL/INDUSTRIAL HARDWARE

The items of commercial/industial door hardware shown in figure 6-33 are usually installed in commercial or industrial buildings, not residential housing. These items are used where applicable, in new construction or in alterations or repairs of existing facilities. Most of these items are made for use in or on metal doors, but some items are made for wood doors. Follow the manufacturer's installation instructions. Recommended door hardware locations for standard steel doors are shown in figure 6-34. Standard 7-foot doors are usually used in commercial construction.

## INTERIOR WOOD TRIM

*LEARNING OBJECTIVE: Upon completing this section, you should be able to identify the types of interior wood trim and the associated installation procedures.*

The casing around the window frames on the interior of a structure should be the same pattern as that used around the interior doorframes. Other trim used for a double-hung window frame includes the sash, stops, stool, and apron (fig. 6-35, view A). Another method of using trim around windows has the entire opening

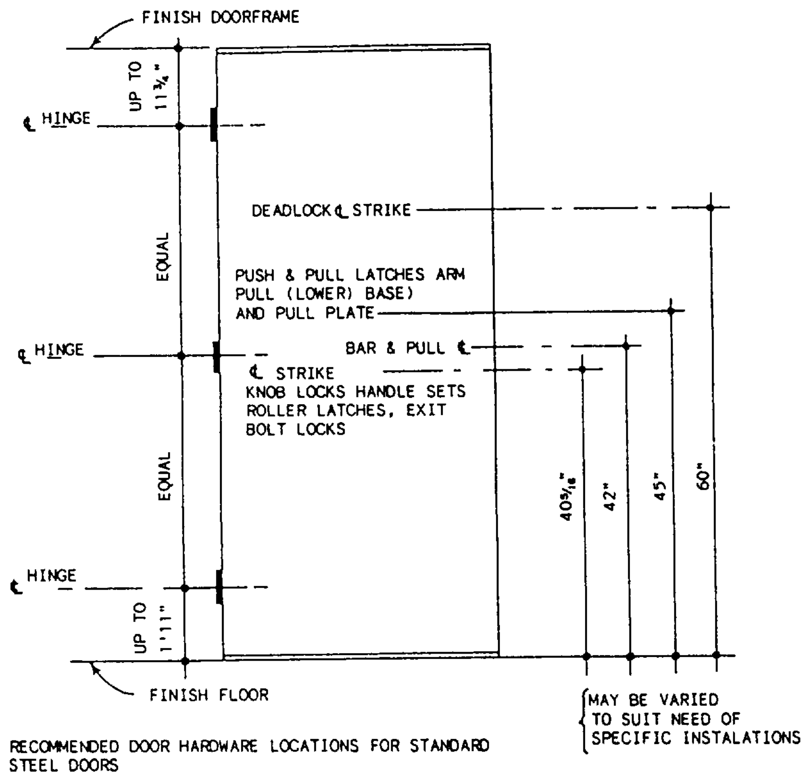



**Figure 6-34.-Location of hardware for steel doors.**

enclosed with casing (fig. 6-35, view B). The stool serves as a filler trim member between the bottom sash rail and the bottom casing.

The stool is the horizontal trim member that laps the windowsill and extends beyond the casing at the sides, with each end notched against the plastered wall. The apron serves as a finish member below the stool. The window stool is the first piece of window trim to be installed and is notched and fitted against the edge of the jamb and plaster line, with the outside edge being flush against the bottom rail of the window sash. The stool is blind-nailed at the ends so that the casing and the stop cover the nailheads. Prechilling is usually necessary to prevent splitting. The stool should also be nailed at the midpoint of the sill and to the apron with finishing nails. Face-nailing to the sill is sometimes substituted or supplemented with toenailing of the outer edge to the sill.

The window casing should be installed and nailed as described for doorframes (fig. 6-26, view A) except for the inner edge. This edge should be flush with the inner face of the jambs so that the stop covers the joint between the jamb and casing. The window stops are then nailed to the jambs so that the window sash slides smoothly. Channel-type weather stripping often

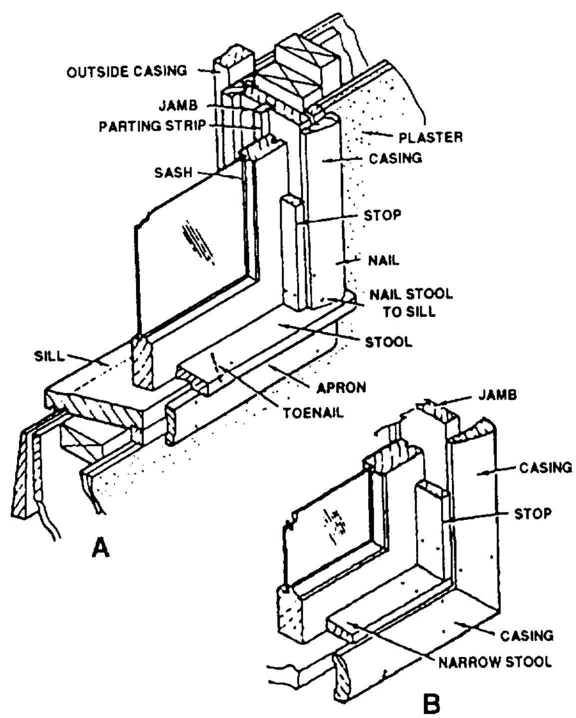



**Figure 6-35.—Installation of window trim.**

includes full-width metal subjambs into which the upper and lower sash slide, replacing the parting strip. Stops are located against these instead of the sash to provide a small amount of pressure. The apron is cut to a length equal to the outer width of the casing line (fig. 6-35, view A). It should be nailed to the windowsill and to the 2-by 4-inch framing sill below.

When casing is used to finish the bottom of the window frame, as well as the sides and top, the narrow stool butts against the side window jamb. Casing should then be mitered at the bottom comers (fig. 6-35, view B) and nailed as previously described.

## BASE MOLDING

Base molding serves as a finish between the finished wall and floor. It is available in several widths and forms. Two-piece base consists of a baseboard topped with a small base cap (fig. 6-36, view A). When plaster is not straight and true, the small base molding will conform more closely to the variations than will the wider base alone. A common size for this type of baseboard is 5/8 inch by 3 1/4 inches or wider. One-piece base varies in size from 7/16 inch by 2 1/4 inches to 1/2 inch by 3 1/4 inches and wider (fig. 6-36, views B and C). Although a baseboard is desirable at the junction of the wall and carpeting to serve as a protective bumper, wood trim is sometimes eliminated entirely.

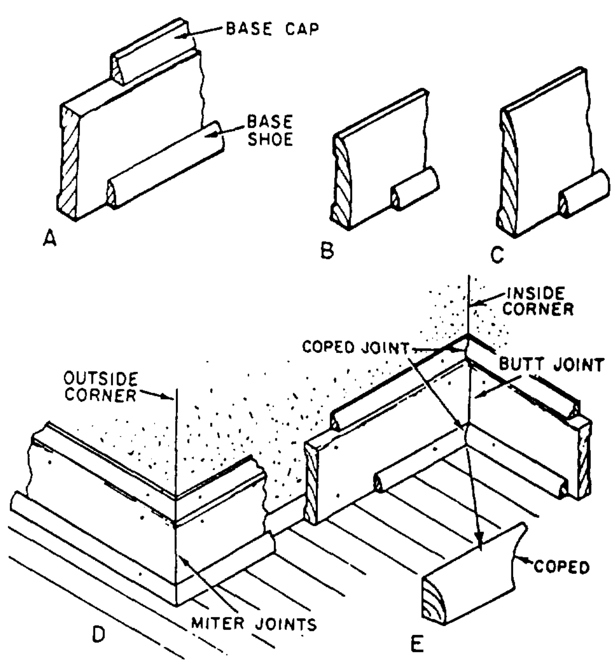



**Figure 6-36.-Base moldings.**

Most baseboards are finished with a 1/2-by 3/4-inch base shoe (fig. 6-36, view A). A single base molding without the shoe is sometimes placed at the wall-floor junction, especially where carpeting might be used.

Square-edged baseboard should be installed with a butt joint at the inside comers and a mitered joint at the outside comers (fig. 6-36, view D). It should be nailed to each stud with two 8d finishing nails. Molded single-piece base, base moldings, and base shoe should have a coped joint at the inside corners and a mitered joint at the outside corners. In a coped joint, the first piece is square-cut against the plaster or base and the second piece of molding coped. This is done by sawing a 45° miter cut and using a coping saw to trim the molding along the inner line of the miter (fig. 6-36, view E). The base shoe should be nailed into the baseboard itself. Then, if there is a small amount of shrinkage of the joists, no opening will occur under the shoe.

To butt-join a piece of baseboard to another piece already in place at an inside corner, set the piece to be joined in position on the floor, bring the end against or near the face of the other piece, and take off the line of the face with a scriber (fig. 6-37). Use the same procedure when butting ends of the baseboard against the side casings of the doors.

For miter-joining at an outside comer, proceed as shown in figure 6-38. First, set a marker piece of baseboard across the wall comer, as shown view A, and mark the floor along the edge of the piece. Then set the piece to be mitered in place. Mark the point where the wall corner intersects the top edge and the point where

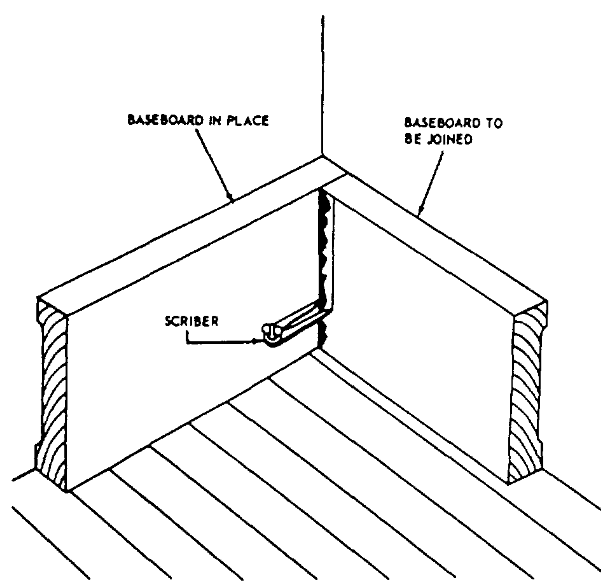



**Figure 6-37.-Butt-joining baseboard at inside corners.**

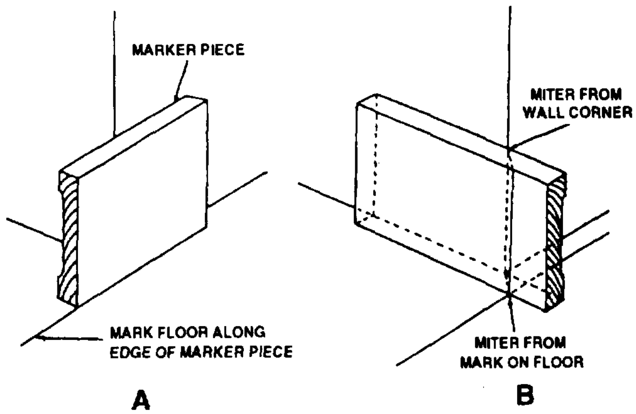



**Figure 6-38.-Miter-joining at inside corners.**

the mark on the floor intersects the bottom edge. Lay 45° lines across the edge from these points to make a 90° corner. Connect these lines with a line across the face (view B), and miter to the lines as indicated.

The most economical, and sometimes the quickest, method of installing baseboard is to use vinyl. In addition to its flexibility, it comes with premolded inside and outside corners. When installing vinyl base, follow the manufacturer's recommended installation procedures for both the base and adhesive.

## CEILING MOLDING

Ceiling moldings (fig. 6-39) are sometimes used at the junction of the wall and ceiling for an architectural effect or to terminate drywall paneling of gypsum board or wood. As with base moldings, inside corners should be cope-jointed (fig. 6-39, view A). This ensures a tight joint and retains a good fit if there are minor moisture changes.

A cutback edge at the outside of the molding (view B) partially conceals any unevenness of the plaster and makes painting easier where there are color changes. For gypsum drywall construction, a small, simple molding (view C) might be desirable. Finish nails should be driven into the upper wall plates and also into the ceiling joists for large molding when possible.

## DECORATIVE TREATMENT

The decorative treatment for interior doors, trim, and other millwork may be painted or given a natural finish with stain, varnish, or other nonpigmented material. The paint or natural finish desired for the woodwork in various rooms often determines the species of wood to be used.

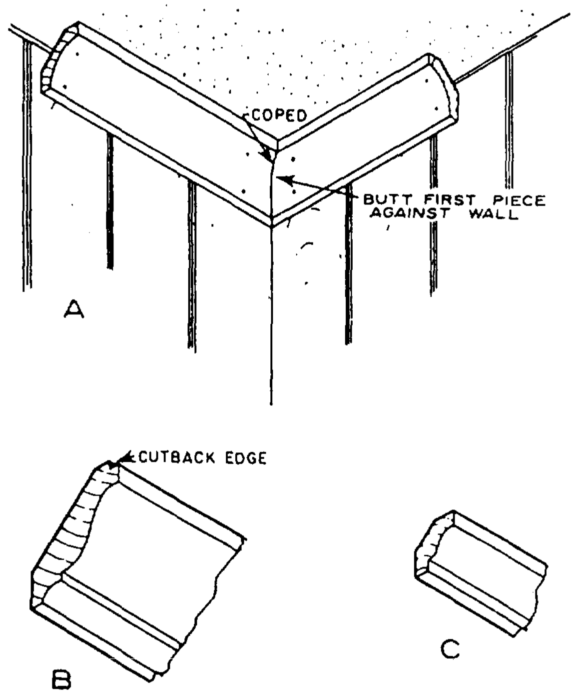



**Figure 6-39.-Ceiling moldings.**

Interior finish to be painted should be smooth, close-grained, and free from pitch streaks. Species meeting these requirements include ponderosa pine, northern white pine, redwood, and spruce. Birch, gum, and yellow poplar are recommended for their hardness and resistance to hard usage. Ash, birch, cherry, maple, oak, and walnut provide a beautiful natural finish decorative treatment. Some require staining to improve appearance.

## RECOMMENDED READING LIST

**NOTE**

Although the following references were current when this **TRAMAN** was published, their continued currency cannot be assured. You therefore need to ensure that you are studying the latest revisions.

*Carpentry*, Leonard Keel, American Technical Publishers, Inc., Alsip, Ill., 1985.

*Exterior and Interior Trim*, John E. Ball, Delmar Publishers, Inc., Albany, N.Y, 1975.

*Wood Frame House Construction*, L.O. Anderson, Forest Products Laboratory, U.S. Forest Service, U.S. Department of Agriculture, Washington, D.C., 1975.