

Chapter 23 - Interior Doors & Trim

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Things to Consider

- **Painting trim before installation is easier and less messy.**
- **Proper care and planning will be required to ensure the walls and flooring are not damaged during installation of the doors and trim**

Components

Interior Doors	Door Casing	Baseboards
Windows Trim	Knee Wall Cap	Quarter Round / Shoe Molding

Timing & Prerequisites

- The hinged doors, bypass door jambs and door casings are installed as soon as the interior walls are painted.
- The baseboards are installed after the doors, trim and vinyl plank flooring have been installed.
- The window trim and knee wall cap are installed after the interior walls are painted and before the flooring.
- The quarter round and shoe molding are installed after the flooring.
- The House/Project Lead will work with the Construction Superintendent to coordinate these volunteer activities.

Materials Needed

Interior Doors	Interior Trim
Pre-Hung Doors	Door Casing (pre-primed)
Door Slabs (By-Pass Doors)	Baseboard (pre-primed)
Jambs for By-Pass Doors	Quarter Round (white)
Shims	Shoe Molding (pre-primed)
2 ½' Pneumatic Nails	Cove molding (pre-primed)
2 ½" Casing Nails	Latex Caulk
Fast and Finish nail hole filler	Silicone Caulk
	2 ½" Pneumatic Nails
	1 ¼" Pneumatic Nails
	Fast and Finish nail hole filler
Handrails	Stain
Handrail	Stain
Handrail Brackets	Rags
	Foam Brushes
Kneewall Cap	Window Trim
1x8 S4S Pine or 5/4 engineered	Adhesive Caulk
Dragon Trim	Door Stop Trim

Phase Specific Tools Needed

Description:	Quantity:
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Woodwork & Trim	
○ Coping Saw	3
○ Nail Set	2
○ Pneumatic Finish Nailer	2
○ Pneumatic Brad Nailer	2
○ Sander	1

Doors

Confirm Door Sizes (Superintendent / Project Lead)

Review the prints to determine the number and size of doors needed.

1. Measure the door openings to confirm door sizes.
 - Changes may have been made during the construction of the walls. If the changes were unintentional, it is too late to change the door opening. A different size door will need to be ordered.
 - Consult the Non-Load Bearing Door Frame Component Sizes chart in Chapter 6 – Walls & Stairs for the correct rough opening sizes for hinged and by-pass doors.
 - A 32” hinged door (2-8) should have an opening of 34”, but anything from 33 ½” to 34 ½” will usually work.
 - Review the prints to identify the swing of the doors. If changes need to be made, verify the changes with the Construction Director / Superintendent.

Doors are identified as right-hand (RH) or left hand (LH) doors depending on the placement of the hinges.

- The swing of the door can be determined by standing in the doorway with your back to the hinged side of the frame.
 - If the door hinges to your right it is a “right-hand hinge”. If the door hinges to your left it is a “left-hand hinge”.
- Adjust the order as needed. Order doors which are approximately 2” smaller than the opening.
2. Validate the doors received.
 - When the doors are delivered, check the inventory of doors to be sure they are doors requested. If the wrong door was delivered, do not open it. It can be exchanged.

Organize Materials

Critical Issues

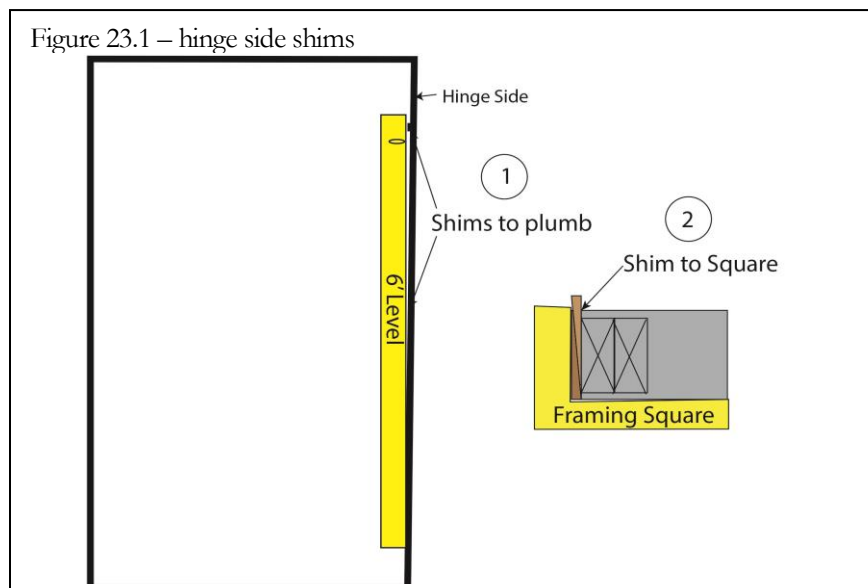
- ◆ Do not lean doors against freshly painted walls. Place a layer of cardboard between the door and the wall to protect the paint.

1. Sort the trim pieces and store them out of the way.
2. Place doors in rooms where they are to be installed.

Install Hinged Doors

Note: the doors should be installed with a pneumatic finishing nailer and 2 ½” finish nails. 2 ½” casing nails can be added after the door is hung.

1. Unpack the door.
2. **Ensure the door fits into the opening.**
 - Position the door in the doorway with the hinge on the correct side.
 - Ensure the door fits in the opening with ¼” to ¾” space on each side of the jamb.
 - Make sure the door swings freely and properly.
 - Set the door aside.
3. **Add shims to plumb the hinge side of the door frame. (see figure 23.1).**
 - Using a 6’ level, add shims to the hinge side of the door frame to create a plumb vertical surface for the hinge jamb.
 - Using a framing square, verify the hinge side of the door frame is square to the wall. Adjust the shims as needed to achieve a plumb and square surface for installing the hinge jamb of the door.

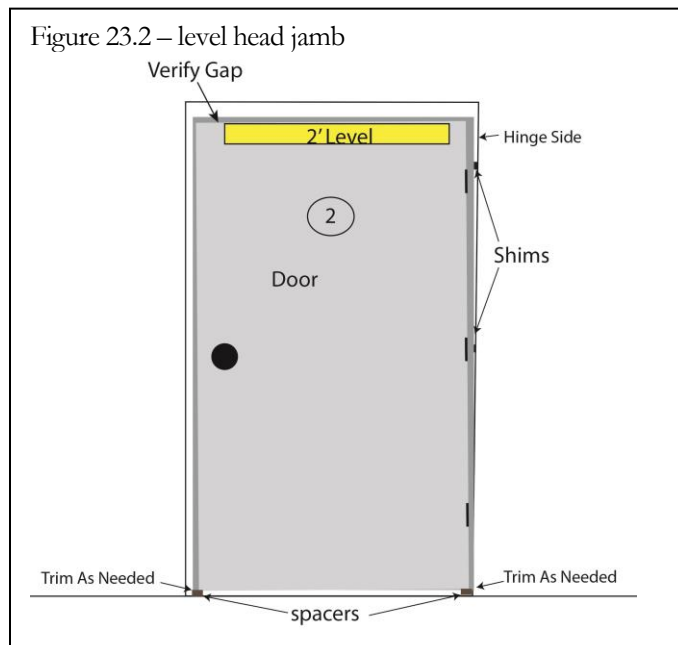


4. Place spacers under the door jambs.

- Set the door back in the opening with spacers under the jambs.
 - If the door will rest on vinyl planks and the flooring has not been installed, insert a small piece of the planking and two (2) pieces of building felt under each side jamb.
 - If the door will rest on carpeting, place a scrap piece of baseboard trim under each side jamb.
 - If the flooring has been installed, set the jambs tight to the flooring.

5. Level the head (top) jamb. (See figure 23.2).

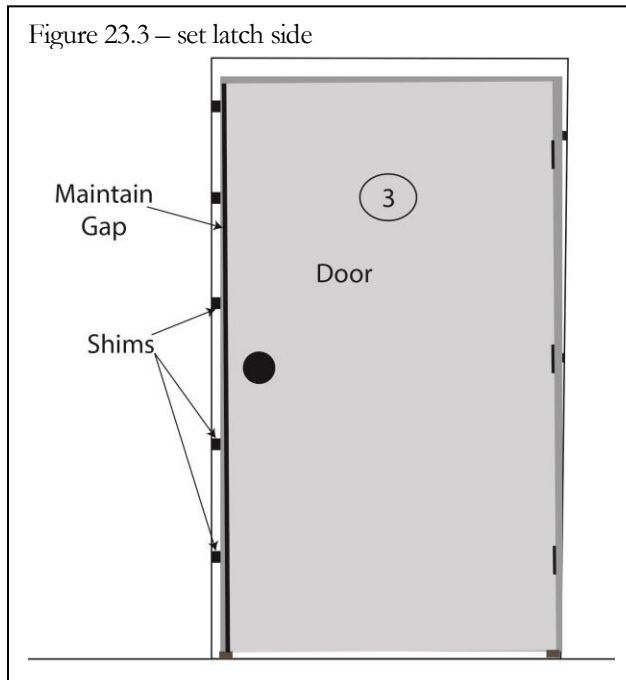
- Using a 2' level, check the level of the top jamb.
- Either:
 - Cut off the high side jamb until the head jamb is level
 - Or add additional spacers under the low side jamb until the head jamb is level.



6. Set the Hinge Jamb.

- Keep the door closed with one volunteer on each side of the door.
- Recheck the wide side of the hinge jamb for plumb and adjust the shims as needed.
- Place two (2) opposing shims between the jamb and the stud at the middle hinge. Add new shims; do not remove the shims from before. Hold the jamb even with the drywall and place a 2 ½" finish nail through the center of the jamb just above the shims.

- Using the 6' level, plumb the narrow side of the hinge jamb. The jamb should rotate on the nail at the middle hinge.
- Place opposing shims between the jamb and the stud at the top hinge. Insert a 2 ½" finish nail through the center of the jamb just below the top set of shims.
- Place opposing shims between the jamb and the stud at the bottom hinge. Insert a 2 ½" finish nail through the center of the jamb just above the bottom set of shims.
- Re-check the jamb to ensure it is plumb on both the wide and narrow edges. Adjust the shims, if needed.
- Place 2 ½" finish nails through the jamb and through each set of shims; one nail on each side of the jamb.



7. Set the Latch and Head Jambs. (see figure 23.3)

- Keep the door closed.
- Starting at the top of the latch jamb, place five (5) sets of opposing shims spaced down the length of the jamb to hold it evenly spaced at 1/8" from the door.
- Place a 2 ½" finish nail through the center of the jamb just above each set of shims.
- After all shims are installed, check the space between the door and the jamb. Check to be sure the door swings freely. Adjust the shims as needed.

- Place 2 ½” finish nails through the latch jamb and through each set of shims; one nail on each side of the jamb.
8. Add Casing Nails
 - Add three (3) 2 ½” casing nails through the hinge jamb into the framing.
 9. Set all nails.

Install Bypass Door Jambs

The bedroom closet doors have been changed to bypass doors without jambs and casing. Other bypass doors such as pantries may still need to be installed with jambs and casing.

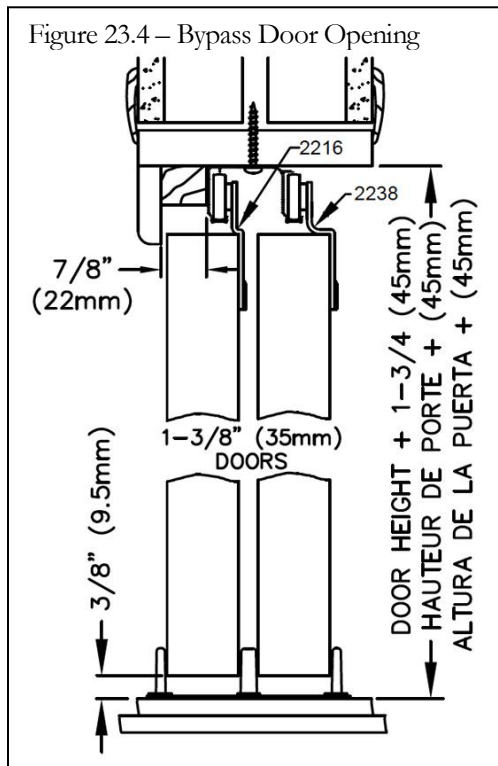
For bypass doors with jambs and casing:

1. Cut 1 piece of jamb material to fit across the top of the doorway. Cut off the notch end. Cut the piece 1” shorter than the width of the doorway.
2. Assemble the top jamb with 2 side precut jambs.
 - Lay the jambs on a flat surface and position the top jamb between the two side jambs with the top jamb fitting into the pockets on the side jambs.
 - Attach the jambs using a pneumatic nailer with 2 ½” finishing nails.
 - Place 3 nails through each side jamb into the top jamb.
3. Place the assembly into the door opening.
4. Place spacers under the side jambs.
 - If the floor under the door will be vinyl planking and the flooring has not been installed, place a small piece of vinyl planking and two (2) pieces of building felt under each side jamb.
 - If the floor under the door will be carpeted, place a scrap piece of baseboard trim under both jambs.
 - If the flooring has been installed, set the jambs tight to the flooring.
5. Using a 6’ level, check the top jamb for level. If the jamb is not level, place additional pieces of building felt under the jamb on the low side until the top is level.
6. Place shims behind side jambs at the top to hold the top tight in the opening.
7. Align the front edge of top jamb flush with the wall, then nail the top of both side jambs into place using a pneumatic nailer with 2 ½” finishing nails. Place 2 nails through each side jamb at the top, 1” from front and back edges.

8. Using the 6' level, shim each side jamb until they are straight and plumb. Having the side jambs straight and plumb is critical to having the doors fit tightly to the frame. Keep the front edge of the side jambs flush with the wall.
9. Nail the side jambs into place with a pneumatic nailer using 2 ½" finishing nails. Place shims every 16"; check for straight and plumb; and then insert 2 nails just below the shims, one 1" from the front and one 1" from the back.
10. After all shims have been installed, recheck that the jambs are still straight and plumb. Adjust the shims as needed. The shims should still be loose, which will allow slight adjustments with a hammer tap. Then place 2 more finish nails through the jamb and shims.

Trim Bypass Door Slabs

Bypass Door Slabs with jambs and casing must be trimmed to fit in the opening. The jambs are pre-cut to a height of 80 ¾". The opening for bypass doors needs to be equal to (Door Height + 1 ¾"). Since the jambs are pre-cut to 80 ¾", the door slabs will need to be trimmed to 79".



- 1) Place Painter's tape across the bottom 1 ½" of the door slab.
- 2) Mark a line 1" above the bottom.
- 3) Add a saw guide above the line by clamping a 2x4 to the door.
- 4) Cut off the bottom 1" of the door. This will cut off the portion of the door with the bottom filler.

- 5) Recover the filler by removing the ¼" plywood shell from the sides of the filler block.
- 6) Glue the filler block into the bottom of the door. Add clamps to secure the block until the glue dries.

Door Casings

Install Door Casings

Casing will be installed on both sides of all interior doors, including closets, and on the inside of all exterior doors.

Top Casing

1. Cut a piece of casing molding to fit across the top of the door from a 7' piece of casing.
 - Miter cut both ends of the molding at 45°.
 - The piece should be cut long enough that the short side (edge toward the door) measures 3/8" longer than the distance between the side jambs.
2. Position the top piece centered across the head jamb with a 3/16" reveal along the top edge.
3. Nail the trim in place with 1 ¼" and 2 ½" finish nails using a pneumatic nailer.
 - Place one nail through the bottom edge of the casing into the head jamb, 2" from the right side of the jamb. Keep the 3/16" reveal along the bottom.
 - Place one nail through the bottom edge of the casing into the head jamb at the center of the head jamb. Keep the 3/16" reveal along the bottom.
 - Push the left side of the casing up to have a 3/16" reveal along the bottom and place one nail through the left side of the jamb into the head jamb. This will hold up the middle of the head jamb.
 - Finish installing the top casing, placing 1 set of 2 ½" nails 12" o.c. along the top edge into the rough framework and placing 1 set of nails along the bottom edge into the door casing with a brad nailer (1 ¼" nails)

Side Casing

1. Cut 2 pieces of casing molding to fit along the sides from 7' pieces of casing.
 - Miter cut the top of the molding at 45°.
 - The pieces should be cut long enough that the short side (edge toward the door) measures the length as the distance from the bottom of the side jamb to the bottom of the top jamb plus 3/16". It may be best to set the casing molding in place and mark it to the top piece which has already been installed.

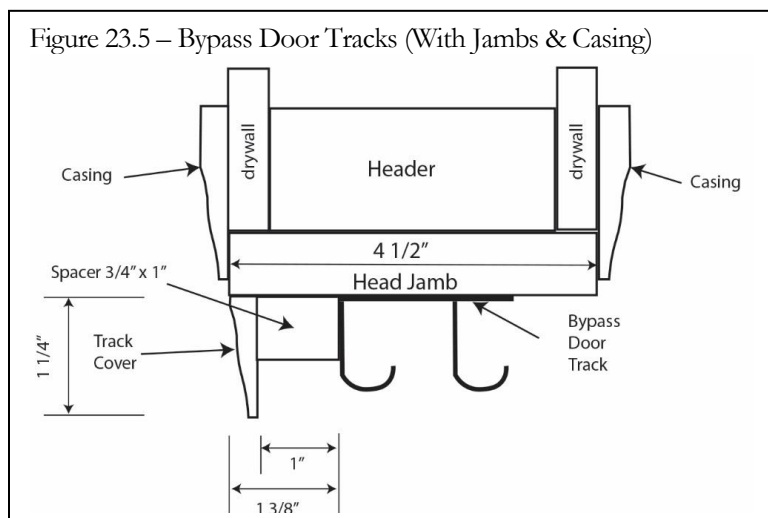
- The molding will be installed flush with the bottom of the jamb and the miter cut will start 3/16" above the bottom edge of the top jamb.
2. Position the casing on the sides of the door flush with the bottom of the jamb and with a 3/16" reveal along the door.
 3. Nail the trim with the pneumatic nailer.
 - Place 1 set of nails along the outside edge into the rough framework with a finish nailer (2 1/2" nails)
 - Place 1 set of nails along the inside edge into the door casing with a brad nailer (1 1/4" nails)
 4. Fill the nail holes with fast-drying spackle.

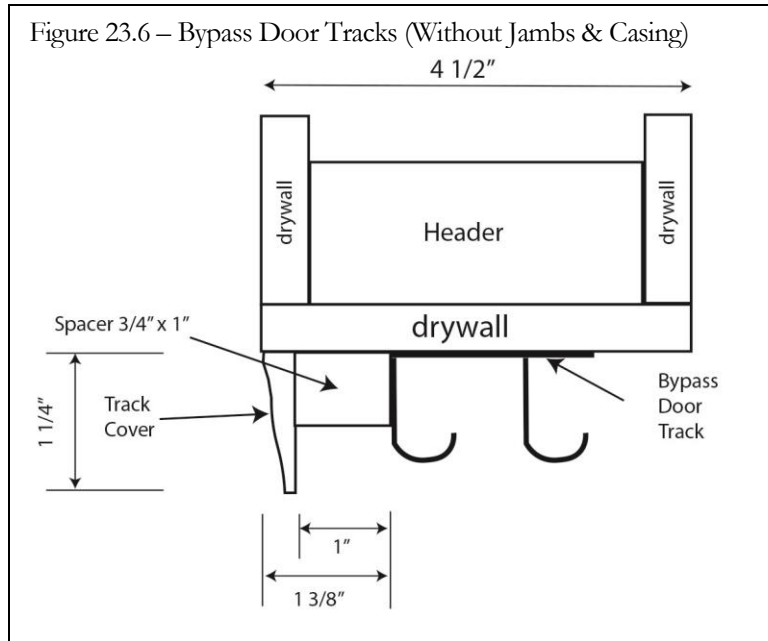
Bypass Door Tracks

Install the Bypass Door Tracks

1. Install the door track to the top jamb per the manufacturer's instructions.
 - a. Cut the metal track to a length 1/8" shorter than the opening.
 - b. Install the track 1 3/8" from front of Head Jamb with screws provided. (See Figure 23.5).

Be sure when installing the track to move it far enough back in the opening to allow the doors to be installed. The door must clear the top insert casing trim.





Install Casing to Cover Bypass Door Tracks

Critical Issues

- ◆ The casing covering the bypass tracks must be ripped down to size to allow the doors to be hung.

1. Cut and install a piece of casing to fit across the top of the doorway opening to cover the bypass door track.
 - Cut the casing to fit snug to the side jambs.
 - Rip the casing to a width which will just cover the track.
2. Attach three (3) 1" x 3/4" blocks of wood to top jamb in front of the track for anchoring the casing.
 - Cut blocks which are 2" x 1" x 3/4".
 - Position the blocks on the head jamb flush to the bypass track. Attach with 2 1/2" finish nails; 2 nails into each block.
 - The blocks must not interfere when hanging the doors.
3. Attach the casing to the blocks with 1 1/4" finish nails through the casing into the blocks.

Install the Bypass Doors and Guides

1. After the doors are painted, install the door rollers on the doors per the manufacturer's instructions.
 - Be sure to install the A and B rollers on the correct doors.
2. After the flooring has been installed, hang the doors on the door tracks.
3. Plumb the doors and install the guides with the screws provided. Drill pilot holes through the flooring and then install the guides.
4. Adjust the doors to fit snug to the side jambs.

5. Install the door opening hardware inserts in each door per the manufacturer's instructions.

Quality Assurance Checklist

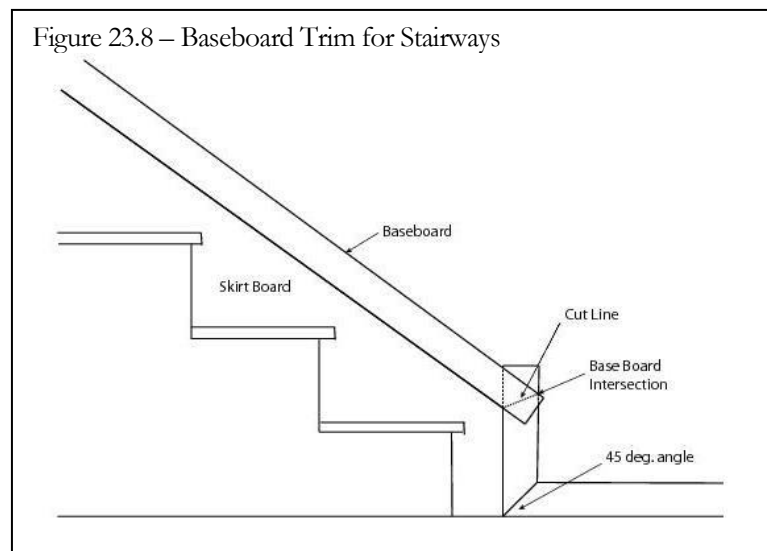
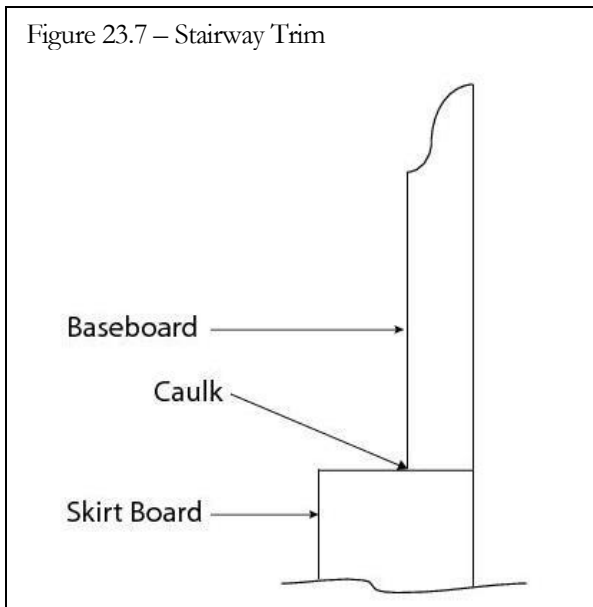
- Ensure all nails have been set, and nail holes have been filled and painted.
- Ensure bypass doors sit flush to the jambs or wall.

Baseboards

Install the Baseboard Trim

1. Space the baseboard up off the sub-floor as follows:
 - In rooms which will be covered with vinyl plank flooring, the baseboard trim will be raised off the floor to allow the vinyl planks to slide under.
 - Insert a small piece of the planking and two (2) pieces of building felt under the trim at 6' intervals.
 - In areas which will be carpeted, the baseboard trim will be raised off the floor to allow the carpeting to be pushed under the baseboards.
 - Cut scrap pieces of baseboard to be used as spacers. Be careful not to use casing trim.
 - Place several spacers under the baseboard before nailing it in place.
 - In areas where vinyl flooring has already been installed, hold the baseboard tight to the flooring.
2. Over the stairway stringers, install baseboard trim as shown in Figure 23.7. This baseboard should not be installed until the stringers are painted.
3. Avoid multiple joints in the middle of walls. If multiple pieces are required for a wall, join the pieces with a spline cut (each piece is cut with a 45 degree angle and fit tight together).
4. Install the baseboard trim with a pneumatic finish nailer. Using 2 ½" finish nails, place two (2) nails through the trim into each stud. Do not nail close to the floor. Nailing close to the bottom will draw in the bottom of the baseboard causing it to be towed-in. Place one (1) nail along the top edge and one (1) in the middle.
5. Inside corners will be joined with a cope joint. The end of the baseboard which extends along the wall which is opposite the door will be cut square. The end of the baseboard which meets the square cut will be cut with a cope joint. In this way, the joint will be constructed so upon entering the room, any imperfections in the joint will not be obvious. To make a cope joint:
 - Make a 45° bevel cut in the baseboard with a miter saw.
 - With a sharp coping blade remove the material outlined by the miter cut.
 - Cut the edge with a slight back-cut.
6. Miter cut the outside corners.
7. At doors with door casing, flush cut the baseboard to the door casing.
8. In corners where doors are within an inch or two of the corner, flush cut the baseboard on both ends and install it prior to installing the adjacent piece of baseboard.

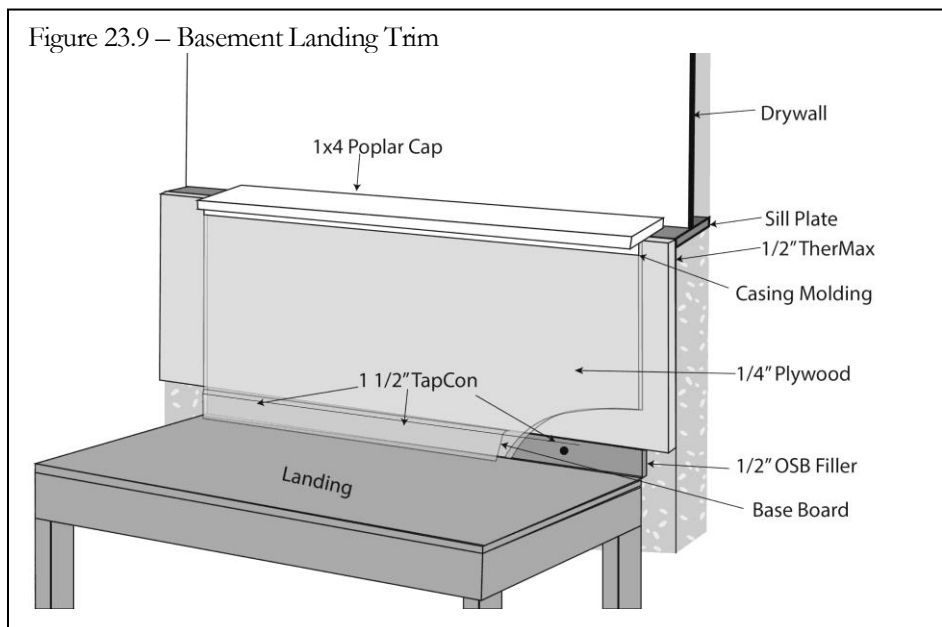
9. Miter the baseboard on the staircase. (See Figure 23.8)
 - Use 2 pieces of scrap baseboard to find the angle.
 - Extend 1 piece over the top of the stringer and 1 piece up the edge of the stringer.
 - Mark where the 2 pieces come to a point.
 - Use the angle from the point at the end of the stringer and the mark to determine the angle for the miter.
10. Fill the nail holes with Fast and Final. When dry, sand to a smooth finish.



Basement Landing Trim

To protect the Thermax at the basement stairway landing, cover the Thermax with $\frac{1}{4}$ " plywood, casing and baseboards. Only cover the portion of Thermax directly above the landing; not down the steps. (See figure 23.9).

1. Install a piece of $\frac{1}{2}$ " OSB in the space between the bottom of the Thermax and the top of the landing. Attach this filler in with $1\frac{1}{2}$ " Tapcons.
2. Install a piece of $\frac{1}{4}$ " plywood over the Thermax and the filler. Install the plywood with $1\frac{3}{4}$ " finish nails; 1 nail every 6" across the top and bottom of the plywood.
3. Install a piece of 1x4 poplar across the top of the sill plate, extending across the top of the plywood. Nail the poplar in place with $2\frac{1}{2}$ " finish nails down through the trim into the sill plate; 1 nail every 12".
4. Install casing trim under the poplar trim to cover the gap below the poplar.
5. Install baseboard trim across the bottom to the plywood to cover the gap below the plywood.



Window Trim

Install the Window Trim

1. Install the door stop trim on the top and sides of the window opening.
 - Cut pieces of trim to fit into the opening; 1 up each side and 1 across the top.
 - Cut the trim at the top corners to 45° angles.
 - Hold the back edge of the trim tight to the window.
 - Install with a pneumatic finish nailer. (1 ¼” nails)
2. Fill the nail holes with Fast and Final. When dry, sand to a smooth finish.

Quarter Round

Install Quarter Round at Bathtub

1. After the bathroom flooring has been installed, cut a piece of white plastic quarter round the length of the tub. Save the cut off piece for across the exterior doors. (See “Install Quarter Round at Exterior Doors” below).
2. Apply a bead of silicone caulk to the edge of the bathtub and the floor.
3. Push the quarter round into the caulk.
4. Nail the quarter round in place with a pneumatic brad nailer. (1 ¼” nails). Place the nails into the floor. Do not nail into the tub.

Install Quarter Round at Exterior Doors

1. After the plank flooring has been installed, cut a piece of quarter round the width of the door.
2. Apply a bead of silicone caulk to the edge of the threshold along the floor.
3. Push the quarter round into the caulk.
4. Nail the quarter round in place with a pneumatic brad nailer. (1 ¼” nails).

Install Quarter Round at Kitchen Cabinets

1. Cut pieces of quarter round stained to match the cabinets to fit along the gaps between the flooring and the cabinets.
2. Install quarter round on exposed sides of cabinets. Do not install quarter round along sides where the range will be installed.
3. Install quarter round along the fronts of the cabinets.
4. Install quarter round on all sides of the island.
5. Nail the quarter round in place with a pneumatic brad nailer. (1 ¼” nails).

Install Quarter Round at Bath Vanities

6. Cut pieces of quarter round stained to match the cabinets to fit along the gaps between the flooring and the cabinets. Cover sides and front of each cabinet.

7. Nail the quarter round in place with a pneumatic brad nailer. (1 ¼” nails).

Shoe Molding

Install Shoe Molding

If there are large gaps between the baseboard and flooring, such as in basements where the cement floor maybe uneven, shoe molding maybe required. Apply shoe molding to the baseboard after the flooring has been installed.

1. Cut shoe molding to fit along the bottom edge of the baseboard molding. Miter cut the shoe molding in the corners. If more than one piece is required for a wall, spline cut the molding.
2. Install the shoe molding with the wider edge positioned against the baseboard molding and the narrow edge positioned against the flooring.
3. Hold the molding down flush to the flooring and attach with a pneumatic nailer using 2 ½” finish nails. Insert the nails at an angle back into the baseboard.
Avoid nailing into the flooring.

Kneewall Cap

Install the Kneewall Caps

1. Create kneewall cap
 - Use a piece of 1x8 S4S poplar or 5/4 engineered Dragon Trim to create the cap.
 - Rip the cap to a width which is 2” wider than the kneewall. Smooth the cut edges with a sander.
 - For horizontal caps, cut the cap to extend over the end of the wall by 1” and flush to the wall at the other end. When cutting out the cap, leave 1 ¼” extra material. Bevel the sides back to the wall. Cut out a “U” to fit to the wall. Scribe the cap to the wall.
 - For diagonal caps, cut the wall end at an angle to fit flush to the wall. Cut the other end at the same angle with the bottom extending over the wall by 1”.
2. Before installing the cap, sand it smooth with an orbital sander; then wipe it clean with a tack cloth. Once the board is sanded and clean, apply a coat of stain or paint based on the Home Owner’s Selection sheet. See “Handrails” in the Painting chapter for details.
3. Install the kneewall cap using a pneumatic finish nailer (2 ½” nails). Make sure the cap is centered on the wall and tight against the vertical wall.

4. Install the cove molding under the kneewall cap. Cut pieces of molding to fit under the cap. Miter cut a 45° bevel into the bottom edges of the trim. Install the trim with a pneumatic finish nailer.
5. Fill the holes with putty. Sand smooth and apply final finish touchup.

Handrails

Install the Handrails

1. Install handrail brackets.

The top of the handrail must be between 32" to 36" from the nosing of the steps. Unless otherwise noted in the plans, set the top of the handrail at 34".

- The bottom screw hole in most brackets is 5 ¼" from the top of the handrail. Measure straight up from the nose of the bottom step 28 ¾" and make a mark. Adjust this measurement based on the size of the handrail bracket.
- Repeat this process for the top step.
- Snap a chalk line between the 2 marks. The bottom screw hole of all brackets will be positioned on this line. Using a stud finder locate framing lumber along this line for installation of brackets; place 1 close to the bottom; 1 close to the top and 1 every 6' in between.
- Plumb the brackets and attach with the screws provided.

2. Cut the handrail to length.

- Cut a 45° angle into the top end of the handrail.
- Place the handrail on the brackets and hold it in place with the top end directly above the nose of the top step; use a level to ensure the location. Mark the bottom of the handrail using a level to draw a plumb line from the nose of the bottom step. Cut a 45° angle at the point where the plumb line intersects the top of the railing.

3. Install handrail returns on each end of the handrail.

- Place the handrail on the brackets and hold in place with handrail centered on each bracket. Measure the distance from the front edge to the wall. This will be the length of the returns.
- Cut two (2) returns from the cut-off ends of the handrail. Cut a 45° angle into the end of the cut-off piece; then cut the piece to length with a 90° angle.
- Glue the returns onto the handrail. The miter joint should be held tight until the glue sets.

4. Handrails can be either painted or stained based on the Home Owner's Selection sheet. See "Handrails" in the Painting chapter for details.
5. Once the paint or polyurethane is dry, set the handrail in place and mark the location of the screw holes on the bottom of the handrail. Remove the handrail and drill pilot holes at each mark. Attach the handrail with screws supplied.
 - Install the screws with a manual screwdriver.
 - Ensure the pilot holes are big enough. The brass screw heads can be easily ruined if too much force is applied.

Quality Assurance Checklist

- Ensure all nail holes in the trim have been filled and painted.
- Ensure the baseboard is nailed tight to the studs.