# Quick Reference Guide

## March 2022

**Version 22.0**

## Chapter 1 - Installing Laminate Beam and Egress Ladders

### Beam Preparation

1. Refer to House Plan and mark beam location on concrete foundation wall
2. Remove any protective cover on beam and check for “UP” designation
3. Determine required length of beam
   a. Measure from back edge of beam pockets – TWICE!
   b. Subtract 1” from measured length
   c. Mark beam at that length and score both faces of beam ½” deep with circular saw

### Move Beam to Pockets

4. Attach a temporary 2x4 (long enough to extend at least 6” past outside edge of foundation) to middle of beam with 16d duplex nails
5. Carefully move beam to the pockets
   a. Assign person to hold end of 2x4 and stabilize beam during beam set
   b. Position beam along a long wall so both ends of the beam rest on the short wall foundations (or sill plates, if present)
   c. Carefully jockey the ends of the beam to slide the beam toward the pockets
   d. Slowly position the scored end over its pocket
   e. Carefully move beam until unscored end drops into its pocket
6. Cut beam to length
   a. Elevate scored end of beam 6-12” with pieces of scrap 2x4 on the foundation
   b. Trim beam with reciprocating saw using score marks as guide
   c. Carefully remove pieces of 2x4 scrap, one piece at a time, to lower beam into pocket

### Complete Beam Installation

7. Position beam with ½” gap between end of beam and back of pocket
8. Align beam with marks on concrete wall
9. Stabilize beam by nailing the long 2x4 from Step 4 to sill plate (or drill hole and attach to foundation bolt)
10. Flush beam with top of sill plates at center mark on both short walls using steel shims
11. Cut scrap treated lumber, wedge between beam and concrete side of pocket. Secure permanently
12. Refer to House Plan and attach support posts to underside of beam with 1½” lag screws and washers
   a. Position plate to be flush with finished side of basement
   b. Set bottom of posts on concrete pad and roughly plumb.
      i. Do not anchor at this time
      ii. **REQUIREMENT:** Threaded adjustment screw/plate must be on the concrete pad

### Straighten and Secure Beam

13. Attach Beam String Jigs, one near each end of the beam
14. Tightly stretch a string line between both jigs and secure
15. If beam is bowed, nail additional 2x4 braces—between joist locations, 2” from outside edge of sill plate
16. Using gauge block between string and beam, adjust braces until beam is straight
17. Plumb posts, check for straight/level, anchor to concrete w/1¼” concrete screws and ¼”x1” fender washers — four per post
18. Cut and install (with wording right-side up) I-joists at each end of the long walls and over each of the posts
19. Check I-joists for crown; adjust beam as needed until each I-joist is straight along its top edge
20. Remove adjustment pins from support posts
21. Leave string from Step 14 in place to confirm beam location during I-joist installation

### Install Egress Ladder(s)

22. Install egress ladder(s) in egress well(s), making sure ladders are plumb
23. Replace metal and wood egress covers
Quality Points

Chapter 1 – Installing Laminate Beam and Egress Ladders

- Verify beam is in correct location (according to House Plan) and correct orientation (top edge is up)
- At each end of the beam, the top of the beam is flush with the top of sill plates at their center mark
- Beam is perpendicular to top of foundation (use a framing square) and tightly, permanently wedged in place
- All required support posts:
  - are installed threaded side down, in proper location (according to House Plan) and flush to finished side of beam
  - Are secured to underside of beam with 1½” lag screws and washers
  - Are secured to support pad with four ¼”x1¾” concrete screws and ¼”x1” fender washers
  - Are plumbed in two directions and all posts are in alignment (site at BOTTOM of posts or use a string)
- Beam is straightened side to side (no bow) using string and secured at each post
- Each supporting I-joist is nailed (3¾” collated nails) to sill plates at both ends and to beam, one nail on each side of I-joist at each location. Wording on the face of the I-joists is right-side up. Double check for if straightness (no bow) by sighting along BOTTOM flange of I-joist
- Beam is level using string and checking any supporting I-joists installed by sighting the TOP flange for any crown. If crown up, lower beam posts or beam shims until level, if crown down then raise beam posts or beam shims until level
- Egress ladder(s) are installed in window well(s). Ladder(s) are plumb, centered on the wall opposite to the window, and secured with two 1¾” concrete screws.
- Metal and temporary wood egress covers are installed.
# Chapter 2 - Installing I-joists, Sill Box

| Preparation | 1. Check Manufacturer’s Layout Plan  
|             | a. Verify all materials are present and in stated dimensions  
|             | b. Note areas where specific dimensions required  
|             | 2. Measure thickness of rim boards (should be 1\(\frac{1}{8}\)”)  
|             | a. Mark thickness on all four corners of sill plates  
|             | b. Snap chalk lines around outside perimeter of sill plates  
|             | c. Check lines for straightness  
| Layout & Install I-Joists | 3. Starting at zero corner, hook tape on the exterior edge of sill plate and layout joist spacing per House Plan  
|             | (typically, on 19.2” centers - diamond mark on tape) on both long wall sill plates and on lam-beam  
|             | a. Use joist layout jig to mark the two sides of the I-joist and mark “X” between side marks.  
|             | 4. To install an I-joist  
|             | a. Verify one end is square. If not, square up one end.  
|             | b. Set the joist on a joist location mark with one end on the chalk line on the zero wall.  
|             | c. Mark the opposite end at the chalk line.  
|             | d. Cut the joist at that mark using joist-cutting jig.  
|             | 5. Install I-joist, so wording on its face is right-side up, with 3\(\frac{3}{4}\)” collated nails.  
|             | a. Nail into sill plate 2” from end on each side of joist.  
|             | b. Nail on each side into lam beam.  
|             | NOTE: Do not hand nail with 16d nails which may split the flange.  
|             | 6. To allow concrete crew access to the basement  
|             | a. Install I-joists at both ends of foundation, near each support post, and a few in the middle (especially if it supports rim board at porch locations)  
|             | b. Cut, and stack remaining joists next to installed joists  
| Layout & Install End Blocking | 8. Beginning at zero corner, layout end block locations 32” o.c. on the short walls from OUTSIDE edge of long wall sill plate.  
|             | 9. At the opposite end:  
|             | a. If the spacing places the last end block<32” from the outside edge of the long wall sill plate.  
|             | i. Install the last end block half way between the next-to-last block and the outside edge of sill plate.  
|             | ii. Repeat this process on the other short wall plate.  
|             | 10. Measure distance from rim board chalk line to the first I-joist at the beam and two ends of the I-joist.  
|             | a. Cut scrap pieces of I-joists to this length  
|             | b. Set block on chalk line and nail to plate with one 3\(\frac{3}{4}\)” collated nails on each side, 2” from end.  
|             | c. Square the block and nail thru rim board into flanges with 2\(\frac{3}{8}\)” collated nails—one top, one bottom.  
|             | d. Flush top of blocking with top of I-joist, square and toenail through joist into block flange with 8d nails—one top and one bottom. Use long clamp to stabilize blocking, if required.  
| Install Rim Boards | 11. Measure width of rim board and rip if greater than the height of the I-joists. Must be = or +\(\frac{1}{8}\)” max.  
|             | 12. Check rim boards for crown and set with crown up. Lay bead of caulk on sill plate and between rim boards, set rim board on the plate, nail to the I-joists’ top and bottom flanges with 2\(\frac{3}{8}\)” collated nails. Do NOT join two boards at an I-joist.  
|             | 13. Toenail rim board to sill plate at 6” intervals with 2\(\frac{3}{8}\)” collated nails.  
|             | 14. Mark the location of end blocking on the outside of the rim board with black marker to later aid nailing bottom wall plates to the blocking.  
|             | 15. For any rim board behind porch areas  
|             | a. If foundation poly extends above the 2” foundation foamboard pull up and staple to rim board.  
|             | b. Cover with house wrap extending 1-2’ beyond the edge of the porch.  
|             | c. Cover with 1” foamboard, 10\(\frac{1}{8}\)” wide, flush with top of rim board, and extending 6-12” beyond the edge of the porch.
Quality Points

Chapter 2 – Installing I-joists, Sill Box

• I-joists are cut to proper length making sure they do NOT extend past the chalk line (too long). If anything, it is better to be SLIGHTLY short so as not to push out the rim board.
• All I-joists are nailed to sill plates and beam.
• Check that each I-joist is straight (no bow) by sighting along BOTTOM flange of I-joist.
• All end blocking are installed, squared to long I-joist both horizontally and vertically and secured to long I-joist and rim board (at both top and bottom flanges).

• Rim board:
  o is no more than ⅛” higher than I-joists
  o is caulked at sill plate and at all joints
  o joints do not fall on an I-joist (must be in between I-joists)
  o is nailed to each I-joist at top and bottom flanges
  o is toe nailed every 6” into sill plates
  o is straight (adjust/shim as needed)
  o is covered with house wrap and foamboard behind each porch/stoop (if zero grade entrance add ¾” decking strip along entire rim board/porch stoop length for top of porch/stoop concrete)

• Stairway framing is in proper location and parallel to closest foundation wall rim board.
**Quick Reference Guide**  

**March 2022**  
**Version 22.0**  

**Chapter 2 - Sill Box Foamboard, Decking and Basement Preparation**

| Cut Foamboard | 1. Rip 1” foamboard sheets into 9-7/16” wide strips  
2. Cut strips into two standard lengths: 18¾” for between I-joists and 31½” for between end blocking  
3. Use Notch Cutting Jig to notch corners of each foamboard piece |
| Install Foamboard | 4. Install foamboard into each sill box area, attaching to rim board with 2” button nails  
5. Apply air sealing caulk all around the inside where the foamboard meets the sill plate and the I-joists  
6. Caulk or tape any seams in foamboard |
| Install Sump Pump Hose | 7. Determine best location for hose to exit the sill box  
8. Drill 2½” hole through rim board  
9. Reposition hose so it exits through that hole |
| Plan & Install Floor Decking | 10. Begin decking at zero corner on side of house that does NOT contain the stairway opening  
11. Determine best layout pattern to minimize waste  
12. Snap chalk lines at 48” intervals across the width of the foundation  
13. Install the first course of decking  
   a. Apply continuous bead of adhesive to the tops of rim boards, I-joists and end blocking  
   b. Drop a sheet of decking on the I-joists, with its grooved edge aligned with the first 48” chalk line  
   c. Square the sheet with the underlying I-joists and nail corners with 8d nails  
   d. Adjust the I-joists to 19.2” centers and nail with 8d nails  
   e. Repeat with all subsequent sheets of decking for the first course (leaving a 1/8” gap between ends of sheets)  
14. Install remaining courses of decking  
   a. Apply continuous bead of adhesive to the tops of rim boards, I-joists and end blocking  
   b. Drop a sheet of decking on the I-joists, with its tongue edge facing the grooved edge of the previous course  
   c. Use a sledge hammer and 6 – 8’ piece of scrap 2x4 to move the new piece tightly to the previously installed course of decking  
   d. Square the sheet with the underlying I-joists and nail corners with 8d nails  
   e. Adjust the I-joists to 19.2” centers and nail with 8d nails  
   f. Be sure to leave a ¼” gap between ends of sheets  
15. Complete nailing of all sheets of decking with seven 8d nails on the edges and five 8d nails in the field  
16. Cut away decking over stairway opening, leaving a 1¼” overhang where the top of the stairs will be attached  
17. Securely cover stairwell opening |
| Basement Preparation | 18. Cut floor drain flush with surface of concrete floor  
19. Remove all debris from basement floor, window frames and egress wells  
20. Sweep floor clean next to foundation walls  
21. Apply radon caulk all around the perimeter of the basement floor where it meets the foundation wall  
22. Cut drain tile 2”-3” below the bottom of the window sill and cover it with a piece of foamboard and at least 2” of stone |
### Quality Points

**Chapter 2 – Sill Box Foamboard, Decking and Basement Preparation**

- Each sill box is filled with a 1” layer of foamboard which is caulked around its entire perimeter and attached to the rim board with 2” button nails (one between I-joists, two between end blocking).
- All seams between decking sheets are no more than ⅛” wide.
- Each decking sheet is properly nailed:
  - seven 8d nails on the edges and five 8d nails in the field
  - nails are sunk to the proper depth
  - any nails that missed the framing below the deck have been removed and re-nailed
- Each sheet has been marked with a red “OK”.
- End blocking marks have been transferred to the top of the decking.
- If stairwell opening has been cut, it must be securely covered by the end of the work day.
- Sump pump hose is repositioned to exit through rim board.
- All debris has been removed from basement floor, the egress wells, and around the basement window frames.
- Basement floor perimeter is caulked with radon caulk.
- Basement floor drain is cut flush with surface of concrete floor.
- Drain tile is trimmed to proper height and covered with foamboard and at least 2” of stone.
## Chapter 3 - Laying Out Exterior Walls

| Layout Exterior Corners | 1. Before laying out walls on the deck, check the perimeter of the deck and stair opening for excess decking or glue and trim as needed.  
| | 2. At each corner measure in 5½” from the outside surface of rim box. Using a square and sharp pencil, create a large initial corner mark (an X, 1-2” in length).  
| | 3. Remove the “Wall Layout Worksheet” from the manual for recording wall measurements.  
| Create a Rectangle | 4. With long steel tape, ‘burn a foot’, and carefully measure the lengths of opposite walls using the initial corner marks from “2” above. Record on the worksheet.  
| | • If opposite wall lengths differ by 1/8” OR MORE, add ½ the difference at each end of the shorter wall  
| | • If walls differ by less than 1/8”, ignore the difference and proceed to Step 5.  
| | • Remark the corners.  
| | NOTE: If house includes a corner porch, see Steps 9,10 below.  
| Square the Rectangle | 5. With a long steel tape, burn a foot and carefully measure the diagonals between the corner marks to check for square. Record on the worksheet.  
| | 6. If they differ by 1/8” or more, adjust the marks as follows:  
| | • At EACH end of the SHORT diagonal, lengthen the LONG wall by ½ the difference.  
| | • Recheck for square and adjust as needed.  
| Check for Rim Bow | 7. Check all four sides of the rim box for bow. Pull a tight string line over the new corner marks at each end of the wall.  
| | 8. Measure between the string line and the outside of the rim board every 4’ to 5’ and record on the Worksheet.  
| | • If the maximum measurement is greater than 5⅝”, move BOTH ends of the line equally toward the rim board until maximum =5⅝”. Remark the deck at each end.  
| | • If the difference is equal to or less than 5⅝”, ignore the difference and proceed to Step 9.  
| | NOTE: If Bow adjustment is ≥3/8”, recheck the rectangle for square and adjust as cited in 5&6 above.  
| Layout Walls on L-Shaped Deck | 9. Square and check bow of main deck as done in Steps 4-8 above  
| | 10. Adjust front deck extension (see Fig on back)  
| | • Stretch tight string line Point 3 to Point 4. Measure line 5-6 and use measurement to locate Point 7 on Line 3-4. Mark deck with X  
| | • Measure Line 4-5 and Line 6-7. If not equal adjust Point 5 or Point 6 to ensure Line 5-6 is parallel with Line 3-4  
| | • In similar manner, adjust Points 6 or 7 to ensure Line 6-7 is parallel with Line 1-5  
| | • Check porch walls for bow and adjust as necessary.  
| Complete Layout | 11. Once all corner mark adjustments have been made, carefully re-measure the precise distances between the corner marks in all directions. Adjust the marks as needed to ensure opposing walls differ by 1/8” or less.  
| | 12. Using these final marks, snap red chalk lines for all exterior wall locations.  
| | 13. Finally, spray all chalk lines with all clear varnish to protect them from the elements.  

(continued on next page)
Quality Points

Chapter 3 - Laying Out Exterior Walls

- Main floor wall layouts are complete:
  - Perimeter of deck and stair opening has been trimmed of all excess decking and glue
  - Exterior and interior walls are marked on deck
  - Opposing walls are of equal length (within 1/8”)
  - Rectangle is square (within 1/8”)
  - Corner porch (if existing) properly laid out

- All wall plates are cut and marked for studs, windows, and doors
  - Long wall bottom plates are marked 51/2” from ends to align with short wall chalk lines
  - All Studs (X), Kings (K), Jacks (J) marked, door and window areas labeled with size on top edges of wall plates
  - All Wall plates are securely nailed together with duplex nails
  - 2 exterior short walls are off the deck and set aside
# Chapter 3 - Cutting Exterior Wall Plates

## Identify Full-Length and Pre-Defined Plate Lengths

1. Before cutting wall plates prepare a plate layout drawing to identify all full-length plates and any pre-defined plate lengths. Sketch the plate lengths on a printed copy of the main floor deck (usually created offsite prior to build day and stored in trailer. If not, obtain a copy of the main deck and lay out marks on it.) Once marked on the drawing, use these length specs to cut the actual plates.
   - a. Full-length plates labeled +/- should be used without cutting.
   - b. Plates labeled with exact dimension should be cut precisely to that dimension.

   **REQUIREMENT:** Top plate joints MUST be over a stud or over door or window header.

2. Identify any 18-20 ft 2x6 lumber. Set aside 4 straightest, wrap in shrink wrap, label with red crayon, “Gable end use only.”

3. Note which walls are long (i.e., extend to the edge of the deck) and which are short.

## Cut Long Wall Plates

4. Starting at zero end of **LONG** wall, lay one end of upper and bottom plates **5½” past the short wall chalk line.** Tack together with duplex nails.

5. Cut and place the remaining upper and bottom plates per the **hand-drawn lengths** on the Plate Layout Drawing. Keeping joints tight, tack together with duplex nails.

   **NOTE:** The chalk line of the short walls may not be exactly 5½” from the outside of the sill box. Therefore, when measuring ALWAYS use these lines as your reference, not the outside of the sill box. Be sure to use lumber with good, clean, and square edges at each end of the wall plates.

6. Field cut the last pieces by measuring **to the chalk line and adding 5½”**.
   - a. Before measuring, be sure the first plate is in correct position and that all joints between plates are tight.
   - b. When finished cutting, both ends of the wall must be cleanly cut, square, and flush

7. Mark the inside edge of the bottom plates **5½” from the end.** This mark **must align** with the chalk line of the short wall (will aid wall construction).

8. Tack top and bottom plates together with duplex nails and set in location on the deck.

9. Repeat the above for the opposite long wall.

## Cut Short Wall Plates

10. As with long walls, consult Plate Layout Drawing for full-length and pre-defined plate lengths
   - a. Set end of first set of plates tight to long wall **chalk line**
   - b. Cut/place intermediate plates and tack with duplex nails
   - c. Measure to opposite **chalk line** and field cut remaining pieces to fit

11. Repeat with opposite short wall

## Complete Plate Layout

12. Recheck the lengths of both sets of opposite walls to be sure they are equal and ends match their chalk lines. If lengths differ by **more than 1/8”**
   - a. Trim the **long set** of plates or
   - b. At the zero end of the **short set** of plates, move the end stud past the end of the plates—e.g., at 1 3/8” rather than usual 1½”. Label mark **DO NOT MOVE**.
Quality Points

Chapter 3 - Cutting Exterior Wall Plates

- At least four, straight 18-20 ft. 2x6’s are set aside, labeled for gable use only and shrink wrapped
- End cut square
- Bottom and upper plates lengths are equal (ends are flush)
- Lumber with good, clean, and square edges used at each end of the wall plates
- Did NOT use extremely crowned, bowed or twisted lumber
- Opposite walls plate sets are equal in length
### Chapter 3 – Marking Windows, Doors-Exterior Wall Plates

<table>
<thead>
<tr>
<th>Mark Window and Door Locations</th>
<th>1. Starting at zero end, lay out the long walls first (See the House plan for zero corner).</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a. Stand plates up with outside edges facing up</td>
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<tr>
<td></td>
<td>b. Hook long tape on end of plate, mark center-line locations (¶) of windows and doors</td>
</tr>
<tr>
<td></td>
<td>c. Label window/door size—e.g., 3040 window, 3068 door—on both plates</td>
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<tr>
<td></td>
<td>2. Layout windows and doors on short walls next</td>
</tr>
<tr>
<td></td>
<td>a. Again, start at zero corner</td>
</tr>
<tr>
<td></td>
<td>b. Extend tape 5½” past end of plates (to account for width of intersecting wall)</td>
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<tr>
<td></td>
<td>3. Referring to window/door sizes on Plate Layout Drawing</td>
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<tr>
<td></td>
<td>a. Mark the location of King and Jack studs</td>
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<tr>
<td></td>
<td>b. For windows, the separation between Jack studs (rough opening) equals the width of the</td>
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<td>window—e.g., separation equals 3’-6” for a 3640 window</td>
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<td></td>
<td>c. For exterior doors, the separation equals the width of the door plus 2½”—e.g., the</td>
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<td></td>
<td>rough opening equals 38½” for a 3068 door.</td>
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<td>NOTE: When laying out the location of the exterior doors, take special note of the</td>
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<td>location of the porch slabs and adjacent walls. The door King studs must be at least 3”</td>
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<td>from an adjacent wall to allow for trim. Verify with the Construction Supervisor where</td>
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<td>the door should be located relative to the porch center.</td>
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<tr>
<td></td>
<td>d. Mark all King studs with a “K” and Jack stud with a “J”.</td>
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<tr>
<td></td>
<td>i. The Jack studs will always be inside the Jack studs.</td>
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<tr>
<td></td>
<td>ii. Label location of both King and Jack studs on the bottom plate</td>
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<tr>
<td></td>
<td>iii. Label location of the King studs only on upper plate</td>
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<tr>
<td></td>
<td>REQUIREMENT: Any opening 6’ or wider requires two Jack studs at each end</td>
</tr>
</tbody>
</table>
Quality Points

Chapter 3 – Marking Windows, Doors-Exterior Wall Plates

- All window and door centers are marked on the outside edges of the upper and bottom plates per the Plate Layout Drawing
  - Centers on long walls are measured from the zero end of the plates
  - Centers on short walls are measured from the zero end of the plates plus 5¼”
- The rough opening for windows equals the size of the window specified in the Plate Layout Drawing
- The rough opening for doors equals the size of the door specified in the Plate Layout Drawing + 2¼”
- Exterior door King studs are at least 3” from adjacent interior walls and the doors are properly located over the porch slab.
- King studs are marked on both upper and bottom plates
- Jack studs are marked only on the bottom plates
- Any windows 6’ wide or wider have 2 Jack studs at each end of the crude opening
## Lay Out Studs on Long Walls

1. Lay out long walls first. Before starting, check opposite walls to be sure they are precisely the same lengths (within 1/8”). If not, trim to equalize.  
   NOTE: This is very important with 24” o.c. framing because it ensures the studs are located directly under roof trusses.
2. Hook a tape on the zero end of the plates and mark the location of all studs on 24” centers  
   a. Mark both edges of studs at +/- ¾” from center and place an “X” within edge marks on all four plates where no window or door. (If using the 50-foot steel tape, do not hook the tape but burn 24” and mark after that.)
   b. If 24” center falls at King stud, leave the “K” designation on that set of plates. If the “K” location is not on center it may have to be moved. See Construction Supervisor or Site Leader.
   c. If 24” center falls within a window, mark a “SX” (“Short Stud”) on bottom plate. (DO NOT mark an “SX” within a door)
3. If length of walls not a multiple of 24”, may be necessary to add extra stud at 48”  
   a. If wall long by ¾” or less, ignore the difference
   b. If >¾”, measure back from end and center stud at 48”  
      i. If it overlaps stud on 24” centers, locate extra stud tight to the one on 24” centers
      ii. Otherwise, center stud at 48” from the end
   c. If house plan does not show OSB sheathing at wall end or if door or window prevents installation of a full 48” wide sheet, see Construction Supervisor.
4. At each end of long walls, layout a corner with two 2x6 studs, making an L-corner  
   a. Make one mark at 1½” from end, mark with “X” (like a normal stud)
   b. Make second mark 5½” from the first mark (the width of a 2x6)
   c. Mark this “L” as “Corner Down”

## Lay Out Studs on Short Walls

5. Extend tape 5½” past zero end and mark studs on 24” centers. Mark “X’s” and “SX’s” as usual.
6. At the non-zero end, again extend tape 5½” past the end and measure back 48”. If no stud at that location, proceed as follows:  
   a. If any stud is centered between 48” and 52½” from the outside corner, the edge of OSB can be centered on that stud during wall building.
   b. If no stud is centered within that range, add a stud at 48” from the end.

## Finish Marking Plates

7. Mark the inside edge of the upper plate with “UPPER” and the inside edge or the bottom plate with BOTTOM. Mark the upper plate with a compass orientation (N,S,E,W) as it lays on the deck.
8. Lay plates flat on deck with inside edges facing in with ends at prescribed locations
9. Mark inside edge of long wall bottom plates 5½” from end to aid wall building
10. Check drawing or deck for intersecting 2x4 or 2x6 walls. At these locations, mark top edges with lines 3 ½” or 5 ½” apart and mark a “W” between the lines. Helps during wall building.
Quality Points

Chapter 3 – Marking Studs-Exterior Wall Plates

- All studs marked on 24” on centers from the zero end
- Additional stud marked (if needed) on non-zero end of long walls
- At the non-zero end of short walls, verify stud marked in proper location for sheathing
- All “SX” studs under window sills are marked
- Both ends of long walls must have “L-corners” marked
- Both ends of longwall bottom plates are marked 5½” from the end to aid in alignment during wall building
### Chapter 3 – Cutting Interior Wall Plates

<table>
<thead>
<tr>
<th>Cutting Plates</th>
<th>1. Cut upper and bottom plates to match the layout on the deck.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Recheck wall intersections to determine which will be “long” and which will be “short” at the intersection (this may be dictated by an adjoining door).</td>
</tr>
<tr>
<td></td>
<td><strong>NOTE:</strong> All closet side walls are typically the “short” wall in the layout and are typically 25” long.</td>
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<tr>
<td></td>
<td>3. On walls that require multiple upper and bottom plates (or have a joint), stagger the upper and bottom plates by placing upper and bottom plates at opposite ends of the wall.</td>
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<tr>
<td></td>
<td>a. Join the ends of top and bottom plates on separate studs.</td>
</tr>
<tr>
<td></td>
<td>b. The upper plate joint must be centered on a stud, not over a door.</td>
</tr>
<tr>
<td></td>
<td>4. On walls that include both full-height and 42”-height sections:</td>
</tr>
<tr>
<td></td>
<td>a. Cut separate plates for each section.</td>
</tr>
<tr>
<td></td>
<td>b. Cut the bottom plate to span the joint.</td>
</tr>
<tr>
<td></td>
<td>5. If the wall will include a 3½” x 3½” full height post at the end of the 42” section, cut upper plate of 42” section 1½” short to accommodate the post.</td>
</tr>
<tr>
<td></td>
<td>6. If the full-height post is not included at the end of the 42” section, cut the bottom plate 1½” short to accommodate other anchoring methods.</td>
</tr>
<tr>
<td></td>
<td>7. Tack plates together with duplex nails, label plates with letter or number and compass orientation when in position on the deck. Label deck with matching number or letter.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Label Short Wall Plates</th>
<th>8. For any 42”-height walls, label the TOP AND BOTTOM plates with “42” WALL/39” STUDS.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>9. For any short wall that supports the closet platform above the stairway, label the plates with “13¾” WALL/10¾” STUDS”.</td>
</tr>
</tbody>
</table>
Quality Points

Chapter 3 – Cutting Interior Wall Plates

- Upper and bottom plates are tacked together with duplex nails
- Upper and bottom plates match layout on the deck and are marked with number/letter and compass orientation
- At intersection of two walls where one includes a door at the intersection end, the door wall abuts the adjoining wall
- On walls requiring multiple upper and bottom plates, plates are staggered and plate ends are centered on top of studs, not over doors
- On walls including a post at end of 42” high section, upper plate is cut 1½” short
- On walls not including a post at end of 42” high section, bottom plate is cut 1½” short
- On 42”-height walls, plates are labeled “42” WALL/39” STUDS”
- On short wall supporting closet platform over stairway, plates are labeled “13¾” WALL/10¾” STUDS”
## Chapter 18 – Installing Swinging Doors

### Door & Opening Prep
1. Check door/frame for damage. If damaged, notify Construction Supervisor or Site Leader.
2. Verify door and size. Check house plan for swing and floor (carpet or hard flooring).
3. Check Jack/King studs for excessive twist. If clearly out of square adjust with shims during installation.
4. Following steps designed to reduce differences between widths of door and door frame to 3/8” or less

|----------------------------|---------------------------------------------------|
| 6. Measure door frame at the head jamb and rough opening at top/bottom hinge locations | a. If difference at either location <= 5/8” add a ¼” x 3” x 5” shim to the top & bottom hinge locations and go to step 7 below. Otherwise  
   b. Nail (with 1¼” finish nails) combination of 1/8” or 1/4” x 3” x 5” shims at top & bottom hinge locations until difference is <5/8” at both locations  
   NOTE: All 3”x5” shims should be placed w/5” dimension vertical & minimum 1/8” shim at each location |
| 7. Check if plumb with a 6’ level, IF PLUMB: | a. Place level against shims, install flat and/or tapered shims at middle until flush with level.  
   b. Proceed to Step 9 |
| 8. If NOT PLUMB | a. Place level against shims and shim top/bottom hinge areas until it is plumb  
   b. Install flat and/or tapered shims at middle hinge location until flush with level |

<table>
<thead>
<tr>
<th>Adjust Strike Side Jack Stud</th>
<th>9. Add layers of 1/8” or 1/4” spacers/shims to strike side jack stud at top/bottom hinge locations until difference in opening is &lt;3/8”</th>
</tr>
</thead>
<tbody>
<tr>
<td>10. Place level against shims and Install spacers/shims at middle hinge area until flush with level</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Temporarily Secure Door</th>
<th>11. Set door in rough opening, tight to hinge side Jack stud. If in carpet area, insert scrap floor trim under each side jamb. Otherwise, set directly on hard finished flooring</th>
</tr>
</thead>
<tbody>
<tr>
<td>12. Center hinge side jamb between both wall surfaces and temporarily wedge door against hinge side with tapered shims against the head jamb</td>
<td></td>
</tr>
<tr>
<td>13. Check that head jamb left/right reveals are equal. Shim hinge or strike jamb up or down as needed.</td>
<td></td>
</tr>
</tbody>
</table>
| 14. Verify that bottom of hinge jamb is still centered between wall surfaces. | a. Add spacers/shims at bottom of jamb and temporarily secure it with one 2½” collated nail above the spacers/shims.  
   b. Do the same for the strike side jamb. |
| 15. Recheck hinge side is still plumb, centered between wall surfaces |
| 16. Verify consistent door stop contact, adjust side jambs as needed |

<table>
<thead>
<tr>
<th>Permanently Secure Door</th>
<th>17. With door still tight to hinges side jamb, secure with one 2½” collated nail at each hinge location on one side of doorstep and through shims.</th>
</tr>
</thead>
<tbody>
<tr>
<td>18. Re-check plumb (on hinges) and jamb centered in wall. Adjust as required.</td>
<td></td>
</tr>
<tr>
<td>19. Replace one short screw in top hinge with #8 3” brass screw. Adjust for equal head jamb reveals.</td>
<td></td>
</tr>
<tr>
<td>20. Recheck door operation and head jamb reveal. Adjust strike side jamb up/down as needed</td>
<td></td>
</tr>
<tr>
<td>21. Verify uniform contact with door stop, latch &amp; strike alignment, jambs centered within wall (max 1/8”) past/shy of wall surface. Adjust as required.</td>
<td></td>
</tr>
</tbody>
</table>
| 22. Check reveals at top and bottom of hinge jamb | a. Shim top as required so top reveal equals reveal below top hinge. Secure with 2½” collated nails on one side of doorstep.  
   b. Shim and nail bottom of hinge jamb until reveal equals top reveal. |
| 23. Check reveals at top and bottom of strike jamb (minimum 1/8”). Shim and nail at the bottom of jamb until equals reveal top. |
| 24. Install and nail (same side of doorstep) remaining shims: latch side top & bottom hinge locations; above the latch location. |
| 25. Install shims in center of head jamb, adjust for consistent reveal across jamb, and nail on one side of doorstep. |
| 26. Re-verify contact between door and doorstep at head jamb and strike jamb. Tap 2x4 scrap or spacer on jamb (<1/8” from plaster) and/or doorstep to adjust. Last resort; remove/re-install doorstep. |
| 27. Install and nail additional shims between hinge locations, strike and hinge side (total 6 sets of shims each side). Adjust for uniform reveals. |
| 28. At all shim locations, nail at opposite side of doorstep. |
| 29. Recheck complete door operation and reveals and adjust if required. |
| 30. Install Door Trim, lockset and door stop |
| 31. Set and putty all nail holes. |
Quality Points

Chapter 18 – Installing Swinging Doors

- Verify install for hard flooring or carpeted area
- Door opens and closes freely and latches snug to striker plate and against door stop
- Uniform reveal at top and sides between door and jamb
- Door trim fits tight to jamb (NO GAP) and is nailed properly (check visually and with “TAP TEST”) and uniform consistent reveal on ALL jambs (sides and top)
- Tight fitting and GLUED miter joints
- All nails set and puttied
- Appropriate door stop installed
### Chapter 3 – Marking Doors-Interior Wall Plates

| Mark Door Locations | 1. Referring to the House Plan and Table of Door Measurements on the Floor Plan, begin by locating and marking door centerlines with ℄.  

   NOTE: The rough opening for all swinging doors is 2” wider than the door size. For sliding doors, the rough opening is ½” wider than the stated door width.  

2. Referring to the door size table on the Floor Plan, locate the King/Jack combinations at each end of the door.  
   a. Label both upper and bottom plates with a “K” and “J”.  
   b. Label only the bottom plate with a “J”.  

3. Mark the location of each door and label with the door size and type—e.g., 4068 sliders.  
   a. For bedroom and bathroom doors, locate the hinge-side King/Jack combination at the intersection with the adjoining wall. (This places the hinge side “tight” to the corner but still allows room for trim.)  
   b. For swinging closet doors except for those at platform end of stairs), and for non-flush sliding doors, locate the centerlines per the House Plan.  
   c. For the closet door at the platform end of the stairway opening, locate the outside edge of the King stud flush with the outside edge of the platform short wall.  
   d. For sliding doors built flush with the exterior wall, locate the inside of the single King/Jack pair the specified distance from the exterior wall—e.g., 60 ½” from the exterior wall for a 5068 door. |
Quality Points

Chapter 3 – Marking Doors-Interior Wall Plates

- Door centers located per House Plan and marked with €.
- KJ pairs located per Door Measurements Table
- Bedroom and bathroom doors located tight to the room wall for proper door swing
- King studs marked on both upper and bottom plates, Jack studs on bottom plates only
- L-Corners marked adjacent tub/shower flange location and at intersection of bedroom/bath doors with adjoining walls
### Lay Out Studs

1. Lay out the studs on 24” centers on both top and bottom plates
   a. If the wall intersects an exterior wall, start from the exterior wall end.
   b. If the wall intersects another interior wall, start layout to match likely sheetrock installation.

2. Where a bathroom or bedroom door connects with an adjoining wall, locate a 2x4 L-corner in the adjoining wall to allow nailing through the L-corner into the King stud of the door.

3. For walls adjoining the stair opening, one wall typically includes a sliding closet door next to the exterior wall and includes a platform of the bottom of the stairs.
   a. If so, layout the wall opposite the closet as usual, starting at the exterior wall.
   b. On the closet side, layout the closet KJ studs and then continue laying out studs on same centers as opposite wall.

4. Locate the plates labeled “13¾” WALL/10¾” STUDS” and layout three studs 24” o.c.

5. For walls adjoining tub/shower, layout studs as usual on 24” centers, starting at intersecting wall.
   a. At the opposite end of the short, 36” wall, layout an L-Corner with base of L on surface facing tub (provides vertical blocking for tub flange).
   b. On opposite wall, center another L-Block opposite that on the short wall (~31½” from back wall).

6. Make certain that door rough openings are at least 3” from the end of the wall to permit later installation of door trim

7. On top edges of plates, mark the location of any intersecting walls with lines and a large “W” between the lines to aid in locating intersecting walls during wall building

8. When complete, label top and bottom plates and tack together with duplex nails. Mark compass orientation and label both plates and deck with identifying number or letter.
Quality Points

Chapter 3 – Marking Studs-Interior Wall Plates

• Stud layouts start at an exterior wall or at a junction matching expected sheetrock layout

• All studs are laid out on 24” centers, including
  
  o Both sides of stairway
  
  o The 13½” wall supporting the stairway platform

• Layout of both walls next to the tub/shower include L-Corners 31½” from back wall

• Walls adjacent bath and bedroom doors include L-Corner next to KJ studs

• Intersecting walls are marked with lines and “W” to aid wall building
Quick Reference Guide

Chapter 4 – Building Exterior Window, Door Components

| Identify & Sort Component Lumber | 1. Before marking and cutting any component pieces, crown, mark and sort general 2x6 lumber.  
| | a. Mark and set aside very straight pieces for use in the kitchen, tub wall, and ends of sliding closet doors.  
| | 2. Locate and confirm separate Component Package expressly intended for component construction. It should consist of 2x10’s, 2x6’s, and 2x4’s along with one 8’1x6.  
| | 3. Determine window and door sizes and dimensions from House Plan Supporting Documents.  
| Cut Pre-Defined Component Pieces | 4. Referring to the Component Cut List, cut pre-defined pieces of 2x10 and 2x6 header pieces, 2x6 window sill pieces, and 2x6 Jack studs.  
| | a. Locate the set of cutting diagrams and package of Component Assembly Drawings in a 3-ring binder in the site support box.  
| | b. From the Component Package, select a lumber piece of the specific length shown on the bar chart—e.g., a 12’ or 16’ piece.  
| | c. Label each piece with its length and set aside for assembly.  
| | d. Make a check mark on the cutting diagram to record each piece has been cut.  
| Assemble Exterior wall Components | 5. Refer to the Component Assembly Drawings showing the specific number of windows and doors required for that house, including the dimensions of individual pieces.  
| | 6. Work on a flat surface. If on concrete, work on a piece of OSB to protect the concrete from protruding nails.  
| | 7. Obtain 3” Collated nails from the Construction Supervisor for use when assembling headers and assembling King/Jack studs. If 3” nails are not available, use 3-1/4” Collated nails instead, taking care to bend over any protruding nails when assembling headers and assembling King/Jack studs.  
| | 8. When assembling headers and King/Jack studs, angle the nailer about 10-20 degrees from perpendicular in the direction of the wood grain before inserting nails.  
| | 9. Carefully align pairs of 2x10 pieces to create an exterior door or window header (windows greater than six feet may require three 2x10 pieces).  
| | a. Ensure that both ends and at least one long edge are flush.  
| | b. Nail with three rows of 3” Collated nails, 2” from each edge and middle, no more than 12” apart, and staggered on the opposite side.  
| | 10. Select two stud-length 2x6’s for use as King studs from the pre-sorted pile and nail to the ends of the 2x10 header assembly with the crown down. Be sure that a flush, long edge of the header is positioned “down” towards where the Jack studs will be located. Take care that both the tops and sides of the King studs are flush with the ends of the header. Nail with three 3¼” Collated nails into each header piece (six nails per King Stud).  
| | 11. Place the matching-length 2x6 header piece between the King studs and tack to the long, flush edge of the header. Square each end of the 2x6 to the adjoining King stud and nail through the King Stud into the end of the 2x6 with three 3¼” Collated nails. Finish nailing the 2x6 to the header.  
| | 12. Select two precut 82” 2x6’s for use as the exterior Jack Studs. These pieces are specifically cut long to allow trimming to match the length of the King Studs.  
| | a. Place each 82” piece next to one of the King Studs, tight to the underside of the header assembly, mark, and field cut to length.  
| | b. Check the crowns of the King and Jack Studs and pair them to match a “crown up” with a “crown down” and any “bows” opposite.  
| | 13. For exterior doors,  
| | a. Place the field cut Jack Stud tight to the header, flush the edges with the King Stud, clamp and nail from the Jack stud into the King Stud with pairs of 3” Collated nails 12” apart, staggered on opposite edges.  
| | b. Cut a 38-1/2” length of 1x6 and nail to the underside of the header with 8d nails.  
| | 14. For windows,  
| | a. Place the field cut Jack Stud tight to the header, flush with the King Stud, clamp and nail from the Jack Stud into the King Stud with pairs of 3” Collated nails no more than 12” apart and staggered on opposite edges.  
| | b. Mark the location of the window sill on the edges of the Jack studs and secure the matching 2x6 sill piece to each King/Jack pair with three 5” Wafer Head screws, obtained from the Construction Supervisor.  
| | 15. When complete, label the face of the header with window or door size and set aside with labeled surface of the header is face up.  

Quality Points

Chapter 4 - Building Exterior Window, Door Components

- Verify correct # of each component and that they are properly labeled with type and size

- All king/Jack pairs are properly nailed (tight together, no gaps) from Jack stud into King stud and are flush at the bottom and along the edges and with top of header and exterior surface of header

- All exterior headers are properly nailed (tight together, no gaps) on both sides and flush at ends and along the top and bottom edges

- Exterior door header includes the 1x6 filler board underneath header

- Header bottom 2x6 is installed square to jack stud/king stud

- All Window headers contain the sill plate

- All components are labeled with size
# Chapter 4 - Building Interior Door Components

## Identify & Sort Component Lumber

1. Before marking and cutting any component pieces, crown, mark and sort 2x4 stud lumber.
   a. Mark and set aside very straight pieces for use in kitchen, tub wall, and sliding closet doors.
2. Locate and confirm separate Component Package expressly intended for component construction. It should consist of 2x10’s, 2x6’s, and 2x4’s along with one 8’ 1x6.
3. Determine door sizes and dimensions from House Plan Supporting Documents.

## Cut Pre-defined Component Pieces

4. Referring to the Component Cut List, cut pre-defined pieces of 2x6 and 2x4 headers and 2x4 Jack studs.
   a. Locate the Components Binder (cutting diagrams, package of Component Assembly Drawings).
   b. From the Component Package, select a lumber piece of the specific length shown on the bar chart.
   c. Label each piece with its length and set aside for future assembly.
   d. Make a check mark on the cutting diagram to record that each piece has been cut.
5. Refer to the Component Assembly Drawings for the specific number of interior doors needed. For Bi-Level homes, do not pre-build basement door components.
6. Obtain 3” Collated nails from the Construction Supervisor, for use when assembling King/Jack studs. If 3” nails are not available, use 3-1/4” Collated nails instead, taking care to bend over any protruding nails, when assembling King/Jack studs.
7. When assembling King/Jack studs, angle the nailer about 10-20 degrees from perpendicular in the direction of the wood grain before inserting nails.

## Assemble Components for Swinging Doors

8. Select two matching lengths precut 2x4’s and nail together lengthwise to create a “T” header. NOTE: Some houses may include a door in a 2x6 wall to accommodate piping from the basement. The T-header for these walls will consist of a vertical 2x4 and horizontal 2x6 per the component cut list.
9. Assemble the door components:
   a. Select two 81” 2x4 pieces from the precut component package for use as Jack studs for each main floor swinging door or two 82” pieces for each basement swinging door.
   b. Nail each Jack stud to a 92-5/8” 2x4 King stud with one crown up and the other crown down and any bows opposite. Flush the sides and one end, clamp and nail with 3” Collated nails, no more than 12” apart, and staggered on opposite sides.
   c. Place the T-header upside-down on top of the Jack studs and nail through the King studs into the ends of both header pieces with two 3-1/4” Collated nails. Do not nail basement king/jacks to their headers.
   d. Label the header with the door size and set assembled component aside.
   e. For basement doors label the header with size of door & “Basement”, label the king/jack pairs with the jack stud length & bundle all pieces together and put in basement.

## Assemble Components for Sliding Doors

10. Construct the T-headers as Step 8 above.
11. For non-flush doors, select two 82” 2x4 Jack studs for each main floor door or two 83” Jack studs for basement doors, pair with two 92-5/8” 2x4 studs and assemble as Step 9b above. Do NOT attach king/jack pairs to their corresponding header (bundle and label header with door size, type and jack studs with jack stud length).
12. For flush sliding doors, select only one 82” Jack stud for each main floor door or one 83” Jack stud for basement doors, pair with one 92-5/8” 2x4 stud and assemble as Step 9b above.
13. Do not attach king/jack pairs to its corresponding header. Label the header with size of door and each King/Jack pair with the jack stud length, bundle together and set aside.
14. For basement doors add “Baseline” to all pieces.

## Assemble Components for Folding Doors

15. Construct the T-headers as Step 8 above.
16. Select two 80” 2x4 Jack studs for each main floor door or two 81” Jack studs for each basement door, pair with two 92-5/8” 2x4 studs and assemble as Step 9b above.
17. Do not attach king/jack pairs to their corresponding header.
18. Bundle and label the header with door size and each king/jack pair with jack stud length.
19. For basement doors add “Basement” to all pieces.
Quality Points

Chapter 4 - Building Interior Door Components

- Verify correct # of each component

- All king/Jack pairs are properly nailed from Jack stud into King stud and are flush at the bottom and along the edges and with top of header and exterior surface of header

- All interior headers are properly nailed

- Main Floor Sliding and Folding door component pieces are bundled together

- Main Floor door component jack stud lengths are as follow: Swinging doors – 81”, Sliding doors – 82”, Folding doors – 80”

- Basement door component jack stud lengths are as follow: Swing doors – 82”, Sliding doors – 83”, Folding doors – 81”

- All components are labeled with door size and type and Jack stud length

- All basement door components are bundled and properly labeled with “Basement” on header and King/Jack pairs.
<table>
<thead>
<tr>
<th>Preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assemble each wall on the deck, then erect in one complete section. Assemble long walls first, short walls after long walls are up.</td>
</tr>
<tr>
<td>2. Remove the temporary nails connecting the plates and separate on the deck.</td>
</tr>
<tr>
<td>a. Separate the plates by about 8’—room for studs and components</td>
</tr>
<tr>
<td>b. Be sure the words “Upper” and “Bottom” remain in the same orientation.</td>
</tr>
<tr>
<td>c. Align the 5½” marks on the end of the bottom plate with the chalk lines of the adjoining short walls.</td>
</tr>
<tr>
<td>3. If not presorted, check all studs for crown.</td>
</tr>
<tr>
<td>a. Place studs with “crown up” and window and door components in position between the plates per marking on the upper and bottom plates. Check that king/jack pairs in components are not twisted.</td>
</tr>
<tr>
<td>b. Make certain that the flush side of the window and door headers faces up.</td>
</tr>
<tr>
<td>NOTE: Set aside the straightest studs for the kitchen walls and bathroom tub wall.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assemble Walls</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Preassemble 2x6 corners for long walls, ensure end and side surfaces are flush, nail every 10”-12” along the length with 3¼” collated nails or 16d nails.</td>
</tr>
<tr>
<td>a. Place the “L” down at the ends of the long wall, flush with the ends and sides of the upper and bottom plates.</td>
</tr>
<tr>
<td>b. Nail with three 3¼” collated nails or 16d nails into each piece of the corner.</td>
</tr>
<tr>
<td>5. Nail top and bottom plates to the studs and components</td>
</tr>
<tr>
<td>a. Mark the inside face of each plate at each layout mark. Use to ensure the studs are square to the plates when nailing.</td>
</tr>
<tr>
<td>b. Make sure the edges of the studs are flush with the ends of the plates, align with the marks, and nail with one 3¼” collated nail or 16d nail through the plate into the bottom third of the stud.</td>
</tr>
<tr>
<td>c. Square the stud to the line and nail with two more 3¼” collated nails or 16d nails, taking care to keep hands or body parts away from the nailer. Use a tool to twist the stud to square if necessary.</td>
</tr>
<tr>
<td>6. Field cut short-cut studs for under each window, measuring for length next to the nearest stud.</td>
</tr>
<tr>
<td>a. Transfer locations for these pieces from the bottom plate to the window sill.</td>
</tr>
<tr>
<td>b. Nail with three 3¼” collated nails or 16d nails at each end.</td>
</tr>
<tr>
<td>7. Check the non-zero end of each wall for an extra stud near the second-last 24” o.c. stud.</td>
</tr>
<tr>
<td>a. If the two are in direct contact, screw them together with three 2½” deck screws.</td>
</tr>
<tr>
<td>b. If the two studs are separated, fill the gap with multiples of ½” foamboard. Screw the studs together with three 4” timber screws to create a tight stud/foamboard “sandwich.”</td>
</tr>
</tbody>
</table>
### Quality Points

**Chapter 5 – Framing Exterior Walls**

- All studs (3 nails) and components nailed in place and tight to plates, flush on ends
- Bottom plate of long walls aligned at 5½” marks
- “L” corners in place and nailed
- Non-zero wall ends with extra studs are screwed together with deck screws and foam/stud “sandwiches” screwed with timber screws.
## Chapter 5 – Squaring, Sheathing Exterior Long Walls

### Preparation
1. Assemble each wall on the deck
2. Align the bottom plate with the chalk line along the entire length and align 5½” mark to short wall chalk line. Use a hammer, toenail through the **bottom face** of the bottom plate into the deck about every 8’ with 8d nails.

### Square the Walls
3. Use diagonal measurements to square the wall, moving the top of the wall **until both measurements are within 1/16”**. (Be sure you have good “corners” when making measurements.)
4. Use a hammer to tack the upper plate to the deck through the **top face** with 3-4 16d duplex nails so it doesn’t go out of square.

### Insulate the Corners and Stud Gaps
5. **Before attaching OSB**, cut four 5¼” x 92⅝” pieces of 1” foamboard (or two pieces of 2” foamboard) and insert into each L-corner. Tape in place.
6. Cut additional 5¼”-wide pieces of foamboard to create stud-foamboard-stud “sandwiches” where studs are less than 3” apart.

### Install OSB Wind Bracing and Sheathing
7. Check the House Plan to see where OSB wind bracing is to be located and position on studs.
   a. At the ends of the wall, center on the stud nominally 48” from the end and flush with the **bottom plate**, but not necessarily flush with the end studs.
   b. The “reveal” at the wall end should be consistent top to bottom—a sign the wall is square.
   c. OSB sheets not at the ends should be centered on studs and flush with the **bottom plate**.
8. If a long wall is the front wall of the house, check with Construction Supervisor if entire wall should be sheathed with OSB. If yes, sheathe the rest of the wall, except above windows and doors.
9. Draw a line on the OSB marking all studs to ensure nails don’t miss the studs. Tack OSB in place, check wall for square, then fasten **wind bracing** with 2¼” collated nails or 8d nails a maximum of 6” spacing, fasten **non-wind-bracing** OSB with 2¼” collated nails or 8d nails following the Non-Wind Bracing OSB Nailing Pattern. (See figure 5-1.)
10. After all required OSB sheets have been nailed, pull the nails securing the upper plate to the deck.

### Attach House Wrap
11. Measure the width of house wrap and subtract 14¾” from the width—e.g., 18” - 14¾” = 3¼”.
   a. Measure up that amount from the bottom of the wall and snap a chalk line the length of the wall.
   b. Staple the top of the wrap to that line at each stud, extending the wrap 12” past the end of the wall.

### Install Foamboard Sheathing
12. Install 1” foamboard between OSB wind bracing, over the house wrap and flush to the **bottom of the bottom plate**. Position foamboard so the grooved side is butted up against any OSB. If this is not possible, cut off the “tongue” of the foamboard before placing it next to the OSB. Nail with 2” button nails following the Foamboard Nailing Pattern (See figure 5-2). Nails should be shared between two abutting pieces of foamboard. Nail only into King studs and into the header (2¼” away from opening) around windows and doors. **Do not nail into window sills.**
13. Install ½” foamboard over OSB, flush on all sides. Nail with 1” button nails following the Foamboard Nailing Pattern (See figure 5-2). Tape all seams.
   
   **CAUTION:** Install ½” foamboard over wind bracing OSB **only** if inspection is not required (see Construction Supervisor).

15. Fold bottom of house wrap onto sheathing and tape with air sealing tape every 3'-5'.
Quality Points

Chapter 5 – Squaring, Sheathing Exterior Long Walls

- Bottom of wall aligned with chalk line and 5½” mark
- Wall squared and bottom plate tacked to deck
- Wind bracing and non-wind bracing OSB installed and properly nailed
- House wrap installed over OSB and under foamboard, taped up over sheathing
- Foamboard installed and properly nailed and taped
Chapter 5 – Erecting Exterior Long Walls

<table>
<thead>
<tr>
<th>Preparation</th>
<th>1. Erect long walls first</th>
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<tr>
<td></td>
<td>2. Apply two generous beads of air sealing caulk parallel to each other along the entire length where the wall will stand except at door openings.</td>
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<td></td>
<td>a. Stay at least 2” away from the chalk line and the deck edge.</td>
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<td></td>
<td>b. Apply a bead of caulk perpendicular to the two long beads at both ends of the deck and at each side of any door opening.</td>
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<td>3. Assemble two braces for each long wall. Attach a 2x4x24” spacer block to the lower inside center of a 14’ or 16’ 2x4 brace with a 16d duplex nail. Center the nail in the spacer block, nail through the long brace into the spacer block. This spacer block will allow clearance for the 1” foamboard on the short walls when they are erected. With one 16d duplex nail, attach the 2x4 brace to each end stud near the upper plate to serve as a temporary support.</td>
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</table>

| Erecting the Long Walls | 4. Stand the wall section up, keeping the inside of the floor plate flush to the chalk line on the deck. |
|                        |   a. On the long walls, be sure to align the 5½” marks on the bottom plates with the adjoining wall chalk lines (the ends of the wall may not align with the edge of the deck). |
|                        |   b. Working from one end of the wall to the other, nail the wall to the deck with two 3¼” collated nails through the floor plate between each stud and into each I-joist. |
|                        | 5. Brace the wall at each end using the long 2x4 braces attached to the wall. |
|                        |   a. Tip the wall out slightly (about ½”). |
|                        |   b. Rotate the 2x4 spacer block attached to the brace horizontally, nail to the rim board with two 16d duplex nails. Add a second nail through the brace into the 2x4 spacer block. |
|                        |   c. Secure the top of the brace with a second 16d duplex nail. |
|                        | 6. Install turnbuckle pipe braces in the middle sections of the wall for extra support. |
|                        |   a. Use three 2½” drywall screws in the upper plate and through the floor into an I-joist. |
|                        |   b. Or, screw the brace into 2x blocking secured to two I-joists with 16d duplex nails. |
|                        |   c. Install the braces 10’ to 12’ apart, but don’t place the brace where an interior wall will intersect an exterior wall. |
Quality Points

Chapter 5 – Erecting Exterior Long Walls

- Thick, double line of caulk laid on deck under bottom plate
- Wall bottom plate is properly secured along chalk line and lined up with short wall marks
- Wall is braced at ends and center
  - Bottom of brace has a 2x spacer against rim board
- Wall is slightly ‘out’ at top
### Chapter 5 – Sheathing, Erecting Exterior Short Walls

#### Preparation
1. Locate blocking between rim board and first/last, I-joist in the basement. Transfer location of blocking to deck or rim board. (Maximum 32” centers.)
2. Align bottom of assembled wall flush with the chalk line along entire length. Use a hammer and toenail through the **bottom face** of the bottom plate into the deck every 6’-8’ with 8d nails.

#### Install OSB Wind Bracing and Sheathing
3. Check House Plan to see if OSB wind bracing is required. OSB wind bracing sheets not located at the wall end should be positioned centered on studs and flush with the bottom plate.
4. If a short wall is the front wall of the house, check with Construction Supervisor if entire wall should be sheathed with OSB. If yes, sheathe the rest of the wall with OSB, except above windows and doors.

**CAUTION:** Do not put OSB sheathing or wind bracing on the ends of the short walls at this point.
5. Draw a line on the OSB marking all studs to ensure nails don’t miss but do not nail at this point. **Tack** wind bracing and any OSB sheathing to bottom and upper plates with an 8d nail in each corner.

#### Attach House Wrap
6. Measure the width of house wrap and subtract 14¾” from the width—e.g., 18” - 14¾” = 3¼”.
   a. Measure up that amount from the bottom of the wall and snap a line the length of the wall.
   b. Staple the top of the wrap to that line at each stud, extending the wrap 12” past the end of the wall. For short walls do not staple wrap that will go under any end OSB. Leave this wrap loose, fold back over the installed sheathing and tape in place.

#### Install Foamboard Sheathing
7. Install foamboard sheathing to short walls that are **not** the front wall of the house.
   a. Install between OSB, over house wrap and flush to bottom of the bottom plate. Position so grooved side butts against any OSB. If not possible, cut off the “tongue” of the foamboard before placing it next to the OSB. Nail with 2” button nails following the Foamboard Nailing Pattern (See figure 5-2). Nails should be shared between two abutting pieces of foamboard. Nail only into King studs and into the header (2¼” away from opening) around windows and doors. **Do not nail into window sills.**
   b. Install ½” foamboard over OSB, flush on all sides. Nail with 1” button nails following the Foamboard Nailing Pattern (See figure 5-2). Nails should be shared between two abutting pieces of foamboard. Tape all seams.
   c. Do not install foamboard over OSB on any short wall that is the front wall of the house. This will be done after wall is erected.

**CAUTION:** Install ½” foamboard over wind bracing OSB only if inspection is not required (see Construction Supervisor).
8. Fold bottom of house wrap onto sheathing and tape with air sealing tape every 3’-5’.

#### Erecting the Walls
9. Following the same procedure as long walls, apply two generous beads of caulk on the deck, raise the wall, and lean against the long wall braces.
10. Align with the chalk line then put two 3¾” collated nails into each I-joist block
11. Remove brace on long wall to let walls come together, check that top plates are flush with each other at each corner.
12. Flush adjoining end studs and nail every 12” from the bottom plate to upper plate with 3¾” collated nails. Brace all corners with 12’-16’ 2x4 bracing from bottom to upper plate on INSIDE of all walls. Keep top of brace less than 1” above upper plate and avoid crossing interior walls.
13. Install end-of-wall OSB on short walls, if required. Cover all OSB with ½” foamboard.
Quality Points

Chapter 5 – Sheathing, Erecting Exterior Short Walls

- Bottom plate secured to deck along chalk line and lined up with 5 ½” marks on long walls
- House wrap installed over OSB and under foam board, taped up over sheathing
- Foam board installed and properly nailed and taped
- Thick, double line of caulk laid on deck under bottom plate
- Wall is secured to long walls at ends/corner is flush
- All corners are correctly braced on the inside.
- All required OSB is nailed in place and covered with foamboard.
# Quick Reference Guide

## March 2022

## Version 22.0

### Chapter 5 – Completing Exterior Walls

| Cut & Install Foamboard | 1. At each wall panel, measure and cut 1" foamboard to fit **tightly** between the bottom of the wall foamboard and the foundation foamboard. Do the same below any OSB/1/2" foamboard. 

NOTE: When installing the sill box foamboard, be sure the house wrap is **behind** the sill box foamboard, leaving the extra wrap protruding from the seam between the bottom of the sill box foamboard and the top of the foundation foamboard. |
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<td><img src="image" alt="Diagram" /></td>
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<tr>
<td>2. Nail with 2” button nails about 8” apart and 2” away from the top and bottom seams of the sill box foamboard.</td>
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<tr>
<td>3. As needed, measure, cut, nail 1” foamboard around porch corners and under door. Fill in gaps at corners. If too narrow to nail, simply tape in place using flashing tape</td>
<td></td>
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</tbody>
</table>
| Tape Seams | 4. Tape the seam between the wall foamboard and top of the sill box foamboard with air sealing tape—**completely cover** the nail buttons above the seam by at least 1/2”.

   a. Ensure the tape is tight to the foamboard above the buttons. 
   b. Do not use additional row of tape to cover nails below the seam. That is not critical. 
   c. House wrap must extend at least 1” over surface of foundation foamboard. If not, see Construction Supervisor. |
| 5. Continue taping other seams **except** for the seam between the sill box foamboard and foundation foamboard. **Do not tape the seam where the house wrap emerges from below the sill box foamboard**. Instead, tape the bottom of the house wrap to the foundation foamboard every 6’ with a 3” piece of air sealing tape just to hold it down. |
| 6. If not already done, fill all exterior corner gaps (both inside and outside corners) with foamboard and tape into place with flashing tape. |
| 7. At other seams, tape shingle style, starting from the bottom, beginning with the horizontal seams, overlapping any vertical seam above. 

   a. When taping horizontal seams, be sure to completely cover button nails above the seams. 
   b. Only tape button nails at the seams, not in the field. |
| Cut, Dispose of Scrap Foamboard | 8. If not yet done, cut out foamboard around windows and doors. Take time to make square cuts. |
| 9. Fill the inside of window and door headers with 2” of foamboard. Fill any gaps > 1/8” with caulk or spray foam. Cover perimeter and joints with flashing tape. |
| 10. Do not throw **ANY** foamboard scraps in the dumpster. Set aside in basement or in black plastic bags. |
Quality Points

Chapter 5 – Completing Exterior Walls

- Foamboard fits tightly between the bottom of the wall foamboard and the foundation foamboard, nailed with 2” button nails about 8” apart and 2” away from the top and bottom seams of the sill box foamboard.
- House wrap is behind sill box foamboard and extends at least 1” over foundation foamboard.
- There is foamboard around porch corners and under door. Corner gaps are filled and taped.
- Seams are taped, except for seam between sill box foamboard and foundation foamboard.
- Bottom of house wrap is taped to foundation foamboard every 6’ with air sealing tape.
- Foamboard around windows and doors is cut squarely.
- Window and door headers are filled with foam and caulked/foamed and taped.
## Chapter 5 – Straightening Exterior Walls

| Mount Corner String Line Supports | 1. To straighten exterior walls, a very taut string line is stretched from one inside corner to an adjacent inside corner. The wall is aligned with the string line every 8’ - 10’ and braced to hold it in place.  
2. For each exterior wall corner, cut a scrap of 2x4 10” - 12” long.  
3. Drive a 16d duplex nail into the center of this 2x4. Be sure the nail is straight since the nail represents the inside of the wall corner.  
4. Place the 2x4 piece on top of the 2x6 upper plates at roughly a 45º angle so the protruding end of the 16d duplex nail rests tightly against the “inside” corner of the upper plates of both walls.  
5. Nail the 2x4 to the upper plates with one 16d duplex nail on each end. Nail securely.  
6. Repeat at each exterior corner.  
7. Treat an extended house/garage wall as one continuous wall during this process. |
| --- | --- |
| Install String Line | 8. In the first corner, start the string line on any nail other than the centered nail. (Feel free to add additional “tie-off” nails as needed.)  
9. Wrap the string line on the exterior side of the protruding centered nail, this should align the string line near the inside edge of the upper plate.  
10. Run the string line to the next corner, wrap it around the exterior of the protruding centered nail again. Continue until back to the starting corner. Make sure the string line is not obstructed between corners and is VERY taut.  
11. Verify the string line around each corner nail is aligned with the inside of the upper plates. Adjust as necessary using an additional 8d nail to move the string line in or out. The string line may not be aligned to the inside of the upper plate all along the wall expanse at this point but it must be aligned at each corner before straightening the walls between corners. |
| Straighten the Walls | 12. Start 5’-7’ from the corner.  
13. Place one end of a 6’ level against the upper plate and the other end against a nearby stud – not the stud immediately below. (This 2-pt contact avoids problems with a bowed or twisted stud.)  
14. Slide the level up the wall until it reaches the string line.  
  a. If the top of the level moves the string, use the turnbuckle pipe bracing to move the wall in until the inner edge of the level lines up with the string line.  
  b. If the level misses the string line, move the wall out until the inside edge lines up with the string line. The wall is now straight in that section.  
15. Do this at each pipe brace, each interior wall intersection, and every 5’-7’ in between. Add pipe bracing or 2x4 bracing as needed to hold the wall straight.  
16. Re-check alignment with string line a second time. Verify wall is plumb at each brace and each intersecting wall location. Consult with Construction Supervisor or Site Leader if difference is more than ½”.  
17. After all bracing is complete, recheck alignment by sighting along inside/outside edges of upper plate at each corner. Remove string line and blocks. |
## Quality Points

### Chapter 5 – Straightening Exterior Walls

- String line properly attached and VERY, VERY Taut
- String line calibrated to upper plate at corners (before straightening)
- Pipe bracing or 2x4 bracing installed to keep walls straight
- Each wall is plumb at each brace and each intersecting wall location with any difference less than ¼”
- Extended wall of attached garage is aligned with corresponding house wall
- Alignment re-checked by sighting along inside/outside edges of upper plate at each corner
## Chapter 5 – Framing Interior Walls

| Preparation | 1. Start by building the longer walls that intersect the exterior walls.  
2. Remove the temporary nails connecting the upper and bottom plates and separate on the deck. Be sure the words “Upper” and “Bottom” remain in the same orientation.  
3. If not presorted, select studs for framing walls by sighting along the edge of each stud to determine which direction the stud is crowned; if crowned, mark with an arrow pointing to the high side, if not crowned, mark with an arrow pointing to one end of the stud.  
4. Do not use a stud if severely crowned.  
5. Use only straight studs for kitchen walls and bathroom tub wall. |
| --- | --- |
| Building the Walls | 6. Place studs, crown up, and door components in position between the plates per the markings on the upper and bottom plates. Make sure the studs are flush with the edges of the plates and that the end studs are flush with the ends of the plates. Nail with two 16d or 3¼” collated nails into the studs. Make sure king/jack pairs in sliding closet walls and door components are not crowned or twisted.  
7. If a half-height wall is planned with a full-height post, the upper plate of the 42”-height section will be 1½” short to accommodate the post. If a full-height post is not planned, the bottom plate will be 1½” short. This will accommodate alternative methods of anchoring the end of the wall to the deck. Studs for a half-height wall will be 39”. |
### Chapter 5 – Framing Interior Walls

- All studs (2 nails) and components nailed in place and tight to plates
- Make sure king/jack pairs in sliding closet walls and door components are not crowned or twisted
- Sliding closet king/jacks are plumb and straight
- Sliding closet header is level
**Chapter 5 – Erecting Interior Walls**

| Preparation | 1. Start by erecting the longer walls that intersect the exterior walls.  
2. Before erecting these walls, install 2x4 blocking between the two exterior wall studs where the interior wall will be located.  
   a. Place this 2x4 with the wide side flush with the interior surface of the studs and top 50” off the floor.  
   b. HAND NAIL with two 16d nails through the studs into the ends of the 2x4.  
3. Wherever a flush sliding door intersects an exterior wall, install a similar block but with the top edge 83½” above the floor. This provides support for the door header at the end opposite that of the single Jack stud.  
   CAUTION: For safety reasons, do NOT use a framing or finish nailer for these two steps. |
| Walls That Do Not Include a Flush Sliding Door | 4. For walls that do NOT include a flush sliding door, stand each wall section up and align the bottom plate with the chalk lines.  
   a. Make sure the bottom plate is tight to the bottom plate of the exterior wall then secure it to the floor using 3¼” collated nails if they will hit an I-joist; otherwise, use 2½” deck screws.  
   b. After checking that the end stud is plumb and tight to the exterior wall, nail at an angle through the exterior wall upper plate into the interior wall upper plate with 16d nails.  
   c. Nail the end stud into the blocking installed in step 2 above. Check that the joints at the upper and bottom plates are tight. |
| Walls That Include a Flush Sliding Door | 5. For walls that DO include a flush sliding door:  
   a. Measure the length of the upper plate and cut a 2x4 (or 2x6 if a 2x6 wall) 1⅝” shorter than that measurement. This will be the top plate for the closet wall.  
   b. Nail that piece to the wall upper plate, extending it 2” beyond the end of the wall upper plate and 3¾” short of the interior end.  
   c. Stand the wall up, move it into position tight to the exterior wall with the door header resting on the blocking.  
   d. Nail the bottom plate to the floor between the chalk lines with two 3¾” collated nails if they will hit an I-joist; otherwise, use 2½” deck screws. Tack loose end of bottom plate in position.  
6. Using a long, straight 2x4 (at least 8’ long) against the closet upper and bottom plates, plumb the wall and nail the end of the upper plate into the exterior wall upper plate with 3¾” collated nails. (The exterior top plate will be notched later.) Make certain king/jack side of closet is straight and plumb.  
7. Using the same long 2x4 against the plates, move the door header against the 2x4 and mark the edge on the horizontal blocking. Then nail the header to the wall blocking at that mark with 3¾” collated nails |
| For Remainder of Walls | 8. Continue to build the remainder of the interior walls, standing them up, positioning to the chalk line, and nailing with either 3¾” collated nails or 2½” deck screws.  
9. Install 2x4 blocking, as in Step 2 above, wherever two interior walls intersect and there is no stud at the point of intersection.  
10. Check that each wall is plumb before nailing it to the adjacent wall.  
11. When erecting a bathroom tub wall use straight studs. Make sure the tub space measures 60¾” at the back, the front, and at bottom, top, and middle. |
Quality Points

Chapter 5 – Erecting Interior Walls

• Wall bottom plates are properly secured along chalk lines, nailed with 3¼” collated nails if hitting an I-joist; otherwise, 2½” deck screws

• Walls are secured at ends, plumb at exterior wall intersections

• Door and closet components are straight and plumb with no twists.

• Tub space is 60⅛” at back, front, bottom, top, middle.
# Chapter 5 – Installing Top Plates

## Requirements

1. Before installing top plates, VERIFY WALL INTERSECTIONS ARE PLUMB and have been marked OK.
2. Walls must be tied together by nailing overlapping top plates to the tops of the walls.
3. Top plates at the intersection of interior and exterior walls are done first.
4. Top plates on all bearing walls must extend a minimum of 4’ on each side of the wall plate joint and at each corner.
5. Top plates on non-bearing walls that extend into the 2” notch of the exterior top plates must be at least 16” long.
6. At all corners of exterior walls and at all corners and intersections of inside walls, the top plate must cross the joint of the wall plates below.
7. Where interior walls intersect exterior walls, create a notch 2” deep in the top plate of the exterior wall so it can receive the intersecting interior wall top plate.
8. Verify that the interior wall is plumb before locating and cutting the notch.

   NOTE: Notching 2” deep leaves 3½” of material on exterior 2x6 top plates

## Installing Top Plates

9. To locate the notches in exterior wall plates, lay the exterior wall top plate on the wall in its final position.
   a. Mark the location of each intersecting interior wall.
   b. Place the top plate on the deck, and using a speed square, mark lines at each location.
   c. Set the blade of a circular saw to a 2” depth.
   d. Cut the marked edge of the top plate at the outside of each line (this should allow clearance for the width of the intersecting top plate).
   e. Make multiple cross-cuts between these two cuts and knock the piece out with a hammer.

10. Nail the wall top plates, using three 16d or 3½” collated nails across the 2x6 plates and two nails across 2x4 plates.
    a. Before nailing, be sure the interior edges of the top plates are flush with the edges of the plates below and that interior walls are tight to the exterior walls.
    b. Nail at each intersection of top plates and at each stud location.
    c. Nail two to four pairs of nails across exterior window and door headers.

   NOTE: Occasionally the house will include a 2x4 interior wall butting against the end of a 2x6 plumbing wall (in a straight line). In this case, install a 2x4 top plate the full length of the wall, on the flush side. Install a 2” wide “filler” on the 2x6 section of the wall (necessary to provide nailing surface for wall sheetrock).
Quality Points

Chapter 5 – Installing Top Plates

- ALL WALL INTERSECTIONS ARE PLUMB and marked OK.
- Intersections of interior and exterior walls completed first
- Top plates on bearing walls extend minimum 4’ on each side of wall plate joint and each corner
- Non-bearing wall top plates extending into 2” notch of exterior top plates are minimum 16” long
- Interior top plates notched into exterior top plates 2” and nailed to exterior wall upper plate
- Top plate crosses joint of wall plate joints below at all corners of exterior walls and all corners and intersections of interior walls
- Interior edges of top plates are flush with edges of plates below, interior walls are tight to exterior walls
- Top plates nailed with three 16d or 3¼” collated nails across 2x6 plates and two nails across 2x4 plates
### Chapter 9 – Installing Windows

#### General Preparation

1. Unpack windows (strapping, etc.) and check for proper size & damage. Report any damage.
2. Measure the rough opening dimensions and check for obstructions
   a. If dimensions exceed specs >½" consider corrections
   b. Remove the screens and sashes and set aside for later installation
   c. Trim any excess sheathing around the perimeter of the opening.
3. Consult Supervise if sill pans or flashing tape are to be used
4. Check level to determine shimming needs (must be at least 1/8” thick)
5. Cut shims 2-3” long for each end, one in middle (or under individual styles) if >36”

#### Prepare Rough Opening using Flashing Tape

6. Cut a length of tape 8-10” longer than the width of the window frame.
7. Lay on the sill with inside edge about 2½” from the outside of the sheathing (inside edge must be at least ½” inside window frame)
8. At each corner and fold tape down and out to the outside of frame
9. Place shims one at each end under end frame, at center if required

#### Prepare Rough Opening using Sill Pans

10. Run a continuous bead of caulk on the sill and about 3” up the sides, ~1/2” from edge of frame (not foamboard)
11. Caulk outside foamboard under window, up ~6” each side, ~1/4” from edge
12. Install ½ of sill pan, seated completely flat on sill. Caulk across the pan near end, install second pan on top and press both tight to the sill.
13. Trim shims (if necessary) to fit inside sill pan lip and place within the pan, one at each end under end frame, at center if required

#### Position, Temporarily Secure Window

14. Run a continuous bead of caulk on foamboard sides and top (outside of window opening), ¼” or less from edge
15. Set window frame in opening, center left/right, up/down (hold for safety)
16. Check shims are in place, if not pry up frame and replace
17. Insert shims into frame and push into place. CAUTION: hold frame securely
18. Open window, check/adjust level on bottom window frame
19. Nail bottom corners w/ 2½” roofing nails (protect window edge)
   **NOTE:** Pound nails in straight. Hold putty knife, shim, flat pry bar against frame to protect it while hammering.
20. Tack top corners (for safety), centered in slot (for adjustment)
21. With double hung windows, open top and bottom sashes slightly, check both reveals.
22. Rack top of window if required to equalize reveal (install shims to hold)
23. With sliders, lift center frame using small pry bar.
24. Complete nailing top corners

#### Permanently Secure Window

25. Place level against outside or inside frame, verify all four sides are straight
26. Draw 4-5” line on foamboard above/below center holes each side
27. Holding frame on line, nail center of flange snugly to hold –all four sides
28. Recheck reveal, window operation
29. Finish nailing (hold to center quality marks/protect window edge)
30. Remove shims installed in Step 22 above

#### Weatherize the Window

31. If sill pan used, tape bottom edge of sill pan to foam with air sealing tape, (do NOT tape **bottom nailing flange of window to sill pan**.
32. Tape sides with air sealing tape, overlapping horizontal tape at the bottom
33. Tape top with flashing tape, overlapping side air sealing tapes
Quality Points

Chapter 9 – Installing Windows

- Window is properly caulked
- Shims placed on top of sill pan or flashing tape are under corner of windows and in the center supports of larger windows
- Bottom frame of window is level, all reveals/margins are consistent
- Every slot in the window flange has a 2½” siding nail
- Side and top flanges taped with appropriate tape in “shingle” style
  - Side flanges taped with air sealing tape
  - Top flange taped with flashing tape
  - Sill pan (if used) is taped to foamboard with air sealing tape
  - BOTTOM flange of window IS NOT taped to sill pan or flashing tape.
  - Top tape fully overlaps/covers side tape
- Window operation:
  - Window sash(es) slides “easily” (using one or two fingers)
  - Window closes, locks and unlocks easily
  - Tilt-in type windows functions properly for easy cleaning
  - Screens are installed
# Chapter 9 – Installing Exterior Doors

## Door & Opening Preparation
1. Inspect for damage. Notify SL or CS if damaged. Nail accessories to the king stud.
3. Pre-drill 1/8” holes (5,5,3) uniformly-spaced in brickmold (3” from mitered corners). Angle slightly to hit studs/headers.
4. If house wrap extends thru doorway, fold down over threshold area and staple to the deck.
5. If not already installed, cut and install length of flashing tape sufficient to cover width and up 2” each side of Jack studs. Install with about half of width on deck, half on foamboard. Cut corners, fold, attach to outside.
6. Install threshold seal tape snug to corners and flush to outside edge of threshold.

## Adjust Hinge Side

**Jack Stud**

7. Mark the height of the hinges off the floor and mark these heights on both the hinge and strike side Jack studs.
8. In all cases, install 3”x5” shims with 5” dimension vertical (using 1¼” finish nails).
9. Measure with of door frame at head jamb and width of rough opening at top and bottom hinge locations.
   - a. If difference between door frame and rough opening at either location is LESS THAN OR EQUAL to 5/8”, add a 1/8” 3x5 shim at the top and bottom hinge locations and go to step 10.
   - b. If difference between door frame and rough opening at either location is greater than 5/8”, attach combination of 1/8” & ¼” 3x5 shims to Jack stud top & bottom locations until difference is less than 5/8” at both locations. (At minimum, each Jack stud hinge location should have a 1/8” shim.)
10. With 6” level check if Jack stud is plumb. If NOT PLUMB, shim top or bottom him locations until it is plumb.
11. Keeping 6” level against top & bottom spacers, attach 1/8” and ¼” flat and/or tapered shims at middle hinge location until flush with the level.

## Adjust Strike Side

**Jack Stud**

12. Add combination of 1/8” and ¼” shims to strike side Jack stud at top/bottom hinge locations until difference < 3/8” at both locations.
13. Place level against shims and install flat and/or tapered shims at middle hinge location until flush.

## Temporarily Secure the Door

14. Set door in rough opening, tight to foamboard and to hinge side stud.
15. Using tapered shims against the head and threshold, wedge door against hinge side with horizontal pressure.
16. Check reveals between the top of door and head jamb at left & right corners. Shim hinge or strike jamb as needed.
17. Recheck hinge side is still plumb (set level on hinge or hinge plates).
18. Tack brickmold tight to foamboard w/4 16d galvanized finish nails, 2 on each side near top and bottom.

## Permanently Secure the Door

19. With brickmold tight to foamboard, secure hinge side jamb with 2½” exterior screws at each hinge location, behind weather stripping and through shims. Recheck plumb (on hinges). Adjust shims as required.
20. Replace two top hinge screws with #8 3” brass-colored construction screws. Adjust for door top reveal.
21. Recheck head jamb reveals are equal at both ends. Adjust strike jamb up/down if needed.
22. Check complete door operation including uniform contact with weatherstripping, latch and strike alignment and all reveals. Adjust shims as required. If necessary, move/shim brickmold away from foamboard (max 1/8” gap). Shim behind brickmold to hold in place.
23. Check reveals at top and bottom of hinge jamb.
   - a. Adjust/reinstall tight shims against the head jamb as required until top reveal equals reveal below top hinge.
   - b. Shim bottom of jamb to match the reveal at the top, secure with 2½” exterior screw behind weather stripping.
24. Check reveals top of strike and hinge jambs (minimum 1/8”). Split difference as needed.
25. Check reveals at the top and bottom of the strike jamb. Shim the bottom of jamb until reveals are equal.
26. Keeping consistent reveals top to bottom, install & screw all remaining shims (behind weather-stripping) on strike side locations: across from top/bottom hinges, above and below dead bolt location.
27. Install & screw shims (behind weather-stripping) at center of head jamb. Adjust for consistent reveal.
28. Recheck complete door operation, contact with weather-stripping and reveals at top and both sides are consistent. Adjust as required.
29. Install and secure additional shims between hinge locations to obtain consistent reveals along both side jambs (total 5 each side plus one extra set above the deadbolt. Secure with 2½” exterior screws behind weatherstripping.
30. At all shim locations, nail exterior side of jamb into Jack stud about 1½'-2’ from outside edge of each jamb (between doorstop and brickmold) w/16d galvanized casing nails.
31. Conduct final verification of complete door operation, uniform contact with weatherstripping. Adjust as needed.
32. Nail brickmold in 13 predrilled holes w/16d galvanized casing nails.
33. Conduct final door operation—contact with weatherstripping and reveals. Adjust if needed.
34. Set and caulk all nails.
35. Install temporary threshold support with scrap 2x4 or 2x6, tight to the underside of the threshold. Use 4 3” timber screws.
Quality Points

Chapter 9 – Installing Exterior Doors

- Flashing Tape and threshold seal tape properly installed
- Brick mold is tight to foam on both sides
- Lockset and Deadbolts are installed, easy to operate, key direction is same for both with notches up, deadbolt strike moves in same direction as deadbolt knob
- Special “security” strike plate is installed for deadbolt with long screws provided
- Door hits weather stripping evenly and no gaps or light show thru door reveals (including installation of “corner seal pads” at bottom of side jambs on weather strip side)
- Long screw(s) installed in top hinge
- Uniform reveal at top and sides (especially near lockset or deadbolt)
- Door opens and closes freely and latches easily and snugly to striker plates
- Brick mold is nailed properly (using 16d galvanized casing nails, 5 on each side and 1 in the center of top being sure to hit jack studs or header)
- Temporary threshold support tight to the underside of the threshold
# Quick Reference Guide

## Chapter 9 Installing Exterior Door Weatherproofing, Hardware

<table>
<thead>
<tr>
<th>Install Weatherproofing and Seal the Door</th>
<th>1. If the plastic temporary threshold covers are not available, use the red “floor” tape (this tape is designed for easy and complete removal)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Apply 4” or 6” wide Weathermate™ Straight Flashing to foamboard and side of brickmold (so it will be completely covered by siding J-channel). To facilitate:</td>
</tr>
<tr>
<td></td>
<td>a. Use a short 2x4 or 2x6 block as a template to mark a line on the wall 3½” or 5½” from the brickmold.</td>
</tr>
<tr>
<td></td>
<td>b. While gradually pealing back the release paper, align edge of tape to line, and stick edge to foamboard.</td>
</tr>
<tr>
<td></td>
<td>c. Progressing down the wall, use speed square or putty knife to press tape to wall and into corner</td>
</tr>
<tr>
<td></td>
<td>d. Finally, press edge of tape to brickmold, making sure it is:</td>
</tr>
<tr>
<td></td>
<td>I. Tucked tightly into the corner and</td>
</tr>
<tr>
<td></td>
<td>II. Attached tightly to both surfaces</td>
</tr>
<tr>
<td></td>
<td>III. This should result in ~ ½” of tape on side of brickmold</td>
</tr>
<tr>
<td></td>
<td>e. Apply tape to sides first and then top (shingle style)</td>
</tr>
<tr>
<td></td>
<td>I. On sides, tape can be applied shingle style but must be at least 20” in length</td>
</tr>
<tr>
<td></td>
<td>II. Top piece must be in one piece and must extend past outside edge of side pieces</td>
</tr>
<tr>
<td></td>
<td>3. Install bottom “Corner Seal Pads”</td>
</tr>
<tr>
<td>Install Hardware</td>
<td>4. Install lockset and strike plate per instructions.</td>
</tr>
<tr>
<td></td>
<td>a. Be sure door latches easily but tightly with little rattle</td>
</tr>
<tr>
<td></td>
<td>b. If it rattles. Bend tab inside the strike plate with flat blade screwdriver</td>
</tr>
<tr>
<td></td>
<td>5. Install the security deadbolt strike plate (not that provided with lockset).</td>
</tr>
<tr>
<td></td>
<td>a. Set strike plate in place, predrill into Jack stud with 3/16” bit, secure with two large screws provided</td>
</tr>
<tr>
<td></td>
<td>b. Make sure deadbolt is installed so top of lever turns in the direction of bold travel. If it does not, remove deadbolt from door, rotate 180° and reinstall</td>
</tr>
<tr>
<td></td>
<td>6. Install lockset per instructions and make sure lockset and deadbolt key direction is the same (notches up). See Fig. 9-2 (Reverses side). If not:</td>
</tr>
<tr>
<td></td>
<td>a. Unlock the lock and insert the key half-way (do not insert completely)</td>
</tr>
<tr>
<td></td>
<td>b. Push in retainer pin (H) on neck of knob, pull knob just past the pin</td>
</tr>
<tr>
<td></td>
<td>c. Holding knob, rotate cylinder (J) to correct orientation</td>
</tr>
<tr>
<td></td>
<td>d. Push in pin and push knob back in place.</td>
</tr>
<tr>
<td></td>
<td>7. Verify Lockset and deadbolt operation. Adjust as needed for easy operation, door closes snugly, latches with little effort, deadbolt engages/disengages easily and moves in same direction as top of lever (Fig. 9-2 next page)</td>
</tr>
<tr>
<td>Install Window Trim Caps</td>
<td>8. For doors with a window, install white plastic trim caps</td>
</tr>
<tr>
<td></td>
<td>a. Be careful to install in correct orientation</td>
</tr>
<tr>
<td></td>
<td>b. Install by hand until almost flush, then with shim and hammer until flush with trim surface</td>
</tr>
<tr>
<td>Install Threshold Support</td>
<td>9. Install temporary threshold support (2x4 or 2x6) with three 4” timber screws.)</td>
</tr>
</tbody>
</table>
## Quality Points

**Chapter 9 Installing Exterior Door Weatherproofing, Hardware & Trim, Support**

- **Threshold protected with the temporary plastic threshold cover or the red “floor” tape.**
- **Weathermate™ Straight Flashing installed tightly in joint between brickmold and foamboard**
  - Tape covers ~ ½” of side of brickmold
  - Tape shingled on sides and over top
- **Bottom corner seal pads installed**
- **All nails set and puttied/caulked** *(toe nails (2 ½” Paslode trim nails) NOT caulked)*
- **Door latches firmly, snug to weatherstripping, and does not rattle**
- **Deadbolt security strike plate installed with long screws**
- **Deadbolt moves in same direction as lever**
- **Latch set and deadbolt key notches are both up**
- **White window trim caps installed—tight and properly oriented**
- **Temporary threshold support installed**

---

**FIGURE 9-2**

![Diagram of door hardware and trim](image)
## Chapter 12 – Air Sealing (caulk, spray foam, tape), Insulating Exterior Walls

### Preparation

1. Mark all stud CENTERS on the floor
2. Mark location of all HVAC ducts (warm and cold air), duct dampers and plumbing pipes
3. Verify all wall and ceiling electrical boxes are marked on the floor (electricians should have done this already).
4. Verify wall studs behind counter are in the same plane. Check at 41” above floor.
5. Verify blocking has been installed for sheetrock at all wall corners, top of walls and perimeter of stair landing and closet over stairway platforms. See “Blocking for Sheetrock”, Section 10.5.3
6. Clean debris from wall cavities. Vacuum subfloors along exterior wall baseplates, exterior doors, and floor vents
7. Remove temporary 2x4 brace under range plenum.
8. Verify jack studs of sliding doors are straight and plumb to within 1/16”
9. Verify exterior wall stud faces adjacent sliding doors are straight, plumb and in the same plane.
10. **Fill the following gaps/holes with spray foam (if >¼”) or air sealing caulk (if < ¼”):**

   a. Ceiling and wall electrical boxes (all levels except attic)
   b. Exterior & interior wall studs (main & basement levels)
   c. Top/bottom wall plates, interior AND exterior walls (BOTH levels)
   d. Exterior wall sheathing or foamboard visible from inside the house
   e. Range plenum area (use spray foam)
   f. Rough opening gaps between window (fill partially) & door frames (fill fully) (Trim or remove excess **ONLY AFTER COMPLETELY DRY**). Also caulk bottom of windows
   g. Inside seam between exterior wall corners
   h. Subfloor penetrations, e.g., tub drain (cover opening with OSB, seal gaps with spray foam), vent pipe, water supply lines and drains
   i. Exterior doors along floor and inside edge of threshold to outside of jambs (thin bead of caulk)
   j. Foamboard spacers over headers (caulk or foam). Tape if foamboard is flush with framing
   k. Gaps between the top of foundation wall foamboard and wall upper plate
11. Seal the inside seam between upper and top plates of exterior walls and inside seams of exterior doors and window components with air sealing tape
12. Fill all sill box penetrations, e.g., dryer vents, HVAC & plumbing pipes, gas line etc. with finish caulk.
13. Secure in-floor heat ducts with two soffit nails
14. Apply a 6” width of HVAC tape around floor ducts to seal gaps between sub-flooring and ducts
15. Seal joint between cold air return boots and ducts (from basement) with HVAC tape.
16. Install foamboard behind PVC pipe located in exterior wall stud bays.

### Air Sealing

17. Push a plastic bag into bath fan ducts for future baths. Fill inside bag and sill box area with batt insulation. See Fig. 12-1 and 12-2
18. Fill exterior wall cavities < 3” wide with foam board. Fill gaps with caulk or air sealing tape.
19. Install foamboard behind exterior wall blocking and in front of overhead electrical blocking
20. Insulate behind electrical boxes with scrap foamboard
21. Install foamboard above window and door headers. Seal perimeter with air sealing caulk or tape
22. Loosely install unfaced R-19 batt insulation into exterior wall cavities:
   a. Split batt to fit around wires
   b. In cavities that are < standard width or height, cut batt ¾” wider/longer than measured opening
   c. **Fill ENTIRE cavities ensuring** there are NO GAPS near upper plates, corners and around wires and pipes and electrical boxes
   d. Do NOT compress batt; be sure to “fluff” out (using a pencil or nail) flush with interior edge of stud
   e. Do NOT cover doorbell, chime and thermostat wires or bathroom vanity light fixture wire
   f. Cut insulation to fit snugly around electrical boxes
   g. Install batt insulation over rigid foam in sill boxes, 11.5” x 19” in long wall boxes, 11.5” x 32” in short wall boxes
23. Do NOT insulate ceiling areas
Jack studs of sliding closet door openings are straight and plumb.

Wall stud faces adjacent sliding closet doors are straight, plumb and in the same plane, and stud faces behind kitchen countertop are in the same plane.

All electrical boxes are sealed (except attic light) and foamboard placed behind boxes.

All exterior basement walls have been insulated with foamboard; foamboard is secured tight to walls.

All foam board edges filling narrow stud bays are sealed.

The gap between window sills and bottom of windows is sealed.

All holes in interior and exterior top/bottom plates are filled.

Seams between exterior wall upper/top plates, exterior wall corners, and exterior door/window components are sealed.

Seams between exterior wall base plates and sub-floor are sealed.

All holes in exterior and interior wall studs on both main floor and basement levels are filled.

All exterior penetrations are sealed from the inside, e.g., foamboard, OSB, sill box foam, range plenum, dryer vent.

All sub-floor penetrations are sealed, e.g., tub drain, vent stack, water lines, drain lines.

Floor vents are nailed and secured with HVAC tape.

Gaps between the rough opening and framing of EXTERIOR doors are fully filled with spray foam or caulk.

Gaps between window rough opening and window framing are partially filled with spray foam or caulk. Window bottoms are caulked along sill pan (or flashing tape if used instead).

Gap on inside edge of exterior door thresholds (along the floor) is caulked to outside of door jambs.

Window and door header areas are filled with foam board and sealed with spray foam or caulk.

Exterior walls are filled with insulation, with no visible gaps around perimeter.

Insulation is fluffed out and flush with interior edge of studs (no stud areas covered).

Vanity, doorbell and thermostat wires are not covered with insulation.

Future bath fan vent duct in basement is lined with plastic and duct and sill box are filled with insulation.

Sill boxes are filled with rigid foam and caulked around the perimeter and batt insulation is installed over 1” rigid foam.

Holes, gaps, or seams in poly are sealed with air sealing tape and poly neatly conformed into all corners for tight sheetrock fit to framing.

All outside corners where ceiling and wall poly meet have been sealed with air sealing tape.
### General Poly Vapor Barrier Installation Rules

1. Minimize staples. Staple about every 24”.
2. Tape holes and seams with air sealing tape.
3. All poly overlaps must cover two studs or trusses.
4. Before stapling at corners:
   a. Tuck poly TIGHT INTO corners - NO AIR GAPS or “stretched” corners but a nice 90-degree crease formed into corner
   b. Verify poly is not bunched up (especially at ceiling/wall corners)
   c. Staple corners with hand tack stapler tight to corner
5. Room length = perpendicular to trusses; room width = parallel to trusses.
6. Use nominal 12” poly for ceiling: 8’ poly for walls.
7. Install all ceiling poly before installing wall poly.

### Install Ceiling Poly

8. Begin installation in a bedroom/bath along an interior wall, kitchen/living room at either side of the starting point line.
9. Create a reference chalk line on the bottom of trusses -- at room width center for bedrooms/baths, 6’ from exterior wall for kitchen/dining/living rooms.
10. If room width >10’, cut poly 1’ longer than room width. Draw a reference line on poly to align to reference chalk line that will result in a 6-8” poly drape down walls.
11. If room width < 10’, cut poly 1’ longer than room width, use center crease to align to reference chalk line.
12. Extend ceiling poly 6”-8” down onto wall. Minimum drape = 3” or total coverage of upper & top plates.
13. Staple at and near room center first for entire length, then move to sides keeping poly taught with push brooms as you go.
14. Overlap seams minimum of 24” (or cover 2 trusses). All overlap seams must be parallel to the trusses. Tape seams along the bottom truss chord.
15. Cover entire upper portions of closets with flush sliding doors with ceiling poly. Cover front from ceiling downward and trim excess along bottom of header. Use a separate piece for ceilings inside closets.
16. X-out poly at electrical boxes & gently stretch poly around box and push poly back at least ½” from surface of box.
17. Cut out poly at bath fan along the outer edge of the flange and tape to the flange perimeter with air sealing tape.
18. X out poly over scuttle access. Fold back and staple to framing. Trim excess.

### Install Wall Poly

19. Verify insulation is not covering inside edge of studs, vanity, door bell & thermostat wires visible.
20. Run poly PAST an exterior corner to the 2nd stud on the intersecting wall.
21. Line up factory edge of wall poly with top of the wall top plate, overlapping ceiling poly hanging down on wall.
22. Start stapling near the corner, only stapling to the top plate of the 1st 4-6 studs, then begin stapling down the studs to the base plate before working back to the corner. Keep poly tight to the corner framing while stapling.
23. Staple to top plate, studs, and window/door framing.
24. X-out poly at electrical boxes & gently stretch poly around box and push poly back at least ½” from surface of box.
25. Tape all seams with <2 stud overlaps with air sealing tape.
26. Cut a “U” shape piece to fit around flush sliding closet door headers. Wrap to 1st interior wall stud past the inside closet corner. Seal around header with air sealing tape.
27. Cut poly along the outside edge of exterior door jambs. Roll up poly and tape above door with painter’s tape.
28. Uncover window openings. From each corner, make a 2” diagonal cut. Then cut straight down and across. Remove and place in the tub. Wrap remaining poly into framing and staple.
29. Place all poly scraps greater than 3’ long in the bath tub for use as painting tarps/drop cloths. Smaller pieces can be stapled to any INTERIOR wall except bathroom walls.
30. Poke vanity wire, doorbell/thermostat wires thru poly. Tape if poly seal is not tight.
Quality Points

Chapter 12 – Air Sealing (Poly)

- All ceiling area is covered with poly

- Ceiling poly is covering upper and top plates around entire house exterior, “7” and there’s a 2 truss overlap on all overlap seams AND taped along trusses

- Ceiling poly corners are tucked tight to framing. Taped areas around posts, outside corners, T-headers etc. does not interfere with sheet rocking and

- Closet headers with flush sliding doors are covered with poly (inside and outside) and header corners are sealed with air sealing tape

- Poly around ceiling and wall electrical boxes has a snug fit (otherwise tape as needed) and poly is pushed up at least ½” from room surface of box

- All exterior wall areas are covered with poly (including 1st 2 studs on intersecting walls)

- Wall poly has minimum 24” (2 stud) overlap of seams (otherwise seams must be taped)

  Wall corner poly is tucked tight to framing in corners (NOT STRETCHED across corner) so that sheetrock will not stretch poly or break upon installation

  - Any holes or tears in poly are taped with air sealing tape. Bath fan perimeter is sealed with air sealing tape.

  - Floor heat ducts are nailed & sealed; seams between cold air return boot and cold air duct are sealed

  - Window and scuttle access poly are cut from each window and excess poly is stapled to framing (Hold off from cutting scuttle poly in the winter. See Construction Supervisor)

  - Poly covering bath fan is cut along outer edge of the fan flange and taped to flange

  - Unusable small scraps of poly (< 3’) are stapled to interior wall surfaces (other than bathroom walls) and larger pieces are temporarily stored in the bathtub for painting day

  - Poly cut along exterior door jambs is rolled up and taped above door with painter’ tape
## Chapter 13 – Ceiling Sheetrock

<table>
<thead>
<tr>
<th>Preparation</th>
<th>1. Verify the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a. Blocking for sheetrock is complete (add as needed), see Sec. 10.5.3 “Blocking for Sheet Rock”</td>
</tr>
<tr>
<td></td>
<td>b. Ceiling poly is neatly tucked into corners (no air gaps or stretched corners). Correct if necessary. Slit corners or pull out and re-staple. Tape holes/slots with air sealing tape.</td>
</tr>
<tr>
<td></td>
<td>c. All ceiling electrical box, HVAC duct &amp; damper access locations are marked on the floor</td>
</tr>
<tr>
<td></td>
<td>d. Truss centerlines are marked where trusses cross INTERIOR wall top plates.</td>
</tr>
<tr>
<td>Planning</td>
<td>2. If starting point has not been pre-determined, develop an installation plan. Use as many full width sheets as possible. Minimum width along interior walls is 16”; along exterior walls is 12”.</td>
</tr>
<tr>
<td></td>
<td>3. Before sheeting the living/dining/kitchen area, snap a chalk line parallel to the exterior wall to indicate starting point (See Section 13.4 and Fig 13-1).</td>
</tr>
<tr>
<td></td>
<td>4. Develop an installation team plan (Cutting/carrying/marking truss centers, quality checking General Installation)</td>
</tr>
<tr>
<td>General Installation</td>
<td>5. Sheets are installed perpendicular to the trusses</td>
</tr>
<tr>
<td></td>
<td>6. All sheets must be secured to at least three trusses (i.e. have 3 rows of screws).</td>
</tr>
<tr>
<td></td>
<td>7. Each sheet must have 7 screws on each end and 5 “in the field”</td>
</tr>
<tr>
<td></td>
<td>8. Screws driven too deep (enough to tear paper around entire screw head) can remain in place, but an additional screw should be added about 2” away</td>
</tr>
<tr>
<td></td>
<td>9. Hold screws back 8-10” from interior walls and back 4” from exterior walls where trusses intersect</td>
</tr>
<tr>
<td></td>
<td>10. Abutting ends should be “factory” edges if possible and always centered on a truss</td>
</tr>
<tr>
<td></td>
<td>11. Measure “tight” and subtract ¼” for EACH wall abutting end</td>
</tr>
<tr>
<td></td>
<td>12. Stagger sheets at least two and preferably three trusses on adjacent rows.</td>
</tr>
<tr>
<td></td>
<td>13. Cutting sheets:</td>
</tr>
<tr>
<td></td>
<td>a. write length on “drop” pieces and stack against wall in central location</td>
</tr>
<tr>
<td></td>
<td>b. check “drop” stack before cutting a full sheet</td>
</tr>
<tr>
<td></td>
<td>14. Cut out the HVAC and bath fan openings before lifting the ceiling rock into place:</td>
</tr>
<tr>
<td></td>
<td>c. Cut bath fan opening to the inside edge of the fan flange or up to ½” wider)</td>
</tr>
<tr>
<td></td>
<td>d. Cut HVAC opening as tight to the duct as possible</td>
</tr>
<tr>
<td></td>
<td>e. Cut HVAC damper openings with a 4 1/8” hole saw</td>
</tr>
<tr>
<td></td>
<td>15. Cut out the following after sheet is installed:</td>
</tr>
<tr>
<td></td>
<td>f. Electrical openings with spiral saw</td>
</tr>
<tr>
<td></td>
<td>g. Attic scuttle with hand saw or spiral saw</td>
</tr>
<tr>
<td></td>
<td>16. To spiral saw cut:</td>
</tr>
<tr>
<td></td>
<td>h. Verify bit extends about 5/8” –¾” past base plate (depth)</td>
</tr>
<tr>
<td></td>
<td>i. Locate box center (start zipping 4” out from center) or at truss where box is attached, move until bit contacts the outside of the box, then move in counterclockwise direction (DO NOT CUT INSIDE THE BOX as this could damage wiring)</td>
</tr>
<tr>
<td>Installation</td>
<td>17. Begin installation in bedrooms and baths at an interior wall corner. For living kitchen/dining/living rooms, installation can begin on either side of the starting point line.</td>
</tr>
<tr>
<td></td>
<td>a. Measure to determine starting piece length from corner to a truss centerline.</td>
</tr>
<tr>
<td></td>
<td>b. Determine location of any HVAC duct or electrical box centers before installing sheet</td>
</tr>
<tr>
<td></td>
<td>c. Extend lift arms as needed to safely support pieces prior to lifting.</td>
</tr>
<tr>
<td></td>
<td>d. Cut piece, load on ceiling lift and secure with enough screws to hold sheet in place (at least 10) but NOT within 24” of area to be spiral cut before removing lift</td>
</tr>
<tr>
<td></td>
<td>e. Spiral cut electrical boxes and finish installing screws (7 on the ends and 5 “in the field”)</td>
</tr>
<tr>
<td></td>
<td>f. Mark truss center lines with pencil using T-square</td>
</tr>
<tr>
<td></td>
<td>18. Quality check entire sheet (refer to Quality Points on back side) and mark OK with scrap piece of sheetrock. Begin quality checks as soon as each individual sheet has been installed.</td>
</tr>
<tr>
<td>Assemble Scuttle Box Cover</td>
<td>19. Cover house and garage OSB scuttle cover with sheetrock</td>
</tr>
<tr>
<td></td>
<td>20. Finish scuttle opening with four sheetrock pieces installed over the perimeter framing. Cut ¾” narrower than measured frame width</td>
</tr>
</tbody>
</table>
|                              | a. Install flush to the top of the scuttle framing, stagger screws at edges about every 12”.
Chapter 13 – Ceiling Sheetrock

- All ceiling sheetrock pieces are installed. No rows along interior walls are less than 16” wide. No rows along exterior walls are less than 12” wide.
- Screws along:
  - interior walls are installed 8”-10” away from the wall
  - exterior walls are installed 4” away from the wall
  - Remove and replace or add if these minimums have not been met
- Sheetrock rows are appropriately staggered (minimum of two, preferably three trusses) and no piece has less than 3 rows of screws
- Openings for attic scuttle, electrical boxes, bathroom fan, HVAC ducts and duct damper accesses (basement) have been cut out. Verify with house plan and markings on floor
- Attic scuttle:
  - side pieces are installed and do NOT extend above top of framing
  - Scuttle Lid cover sheetrock is installed to OSB
- All sheets have been quality checked and marked with an “OK” for the following:
### Chapter 14 – Wall Sheetrock

**Shower Area**

1. Butt sheetrock up to the tub/shower flange (but DO NOT Overlap Flange)

**Window Sills**

1. Cut & install four window frame pieces. Install sill & top first, then sides. Screws (NOT THRU PAN - stay 2 ½” from window frame)

### Quick Reference Guide

#### Preparation

1. Verify the following:
   - Wall blocking is complete (add as needed). See “Blocking for Sheetrock”, Section 10.5.3
   - King/Jack studs on sliding door closet framing have been checked and are straight and plumb to within 1/16”.
   - Exterior wall studs adjacent sliding door closet doors have been checked and are straight, plumb and in the same plane
   - Poly vapor barrier is complete, and any inside corners are fully tucked and NOT stretched across corner
   - The location of all electrical boxes, plumbing pipes and HVAC ducts and damper accesses are marked on the floor
   - All wall stud centers are marked on the floor
   - Doorbell chime & thermostat wires have been poked thru the poly
   - Cold air return boots don’t extend more than ½” beyond the face of the wall studs.
   - PVC pipe in exterior stud bays have been back filled with foamboard. Joints taped
   - All sheetrock staged in house is ½”; garage sheetrock is 5/8”
   - Exterior basement walls have been foam boarded and gaps between top of foamboard and upper plate are sealed
   - Basement foamboard is secured tight to the exterior walls
2. Remove residual caulk/spray foam from window frames and mask frames with 2” painter’s tape
3. Remove temporary stairway handrail

#### Planning

4. Develop an installation plan (cutting/carrying teams, installation teams, room plan-where to start, size of last piece in row, staggerings, etc.)
5. Determine length of 1st sheet in each row. Ensure ending piece will have at least 3 rows of screws and that end joint seams are staggered by at least 2 studs on adjacent rows

#### General Installation

6. All sheets must be secured to at least three studs (i.e. have 3 rows of screws)
7. Each sheet must have 7 screws on each end, 5 “in the field” and 2 in bottom plate between studs
8. Start on top row of an interior wall in a corner where it abuts an exterior wall or in an exterior wall corner.
9. Abutting ends should be “factory” edges if possible and always centered on a stud
10. Measure “tight” and subtract by ¼” for EACH wall abutting end
11. Stagger end joints on each successive row a minimum of two and preferably three studs
12. Keep sheetrock ½”-3/4” away from outside edge of exterior door jambs.
13. Cutting sheets:
   - Cut out cold air returns, switch boxes (mark in place, then saw sides) and plumbing pipes before fastening.
   - Spiral saw cut sheets over windows along the framing.
   - Spiral saw cut around receptacles after sheet is initially secured. Do NOT screw within 2 feet until cut out.
14. Spiral saw guidelines:
   - Verify bit extends about 5/8”- ¾” past base plate.
   - Locate box center or truss where box is attached. Start 4” out from center and move until bit contacts the outside of the box. Move bit counterclockwise (DO NOT CUT INSIDE THE BOX as this could damage wiring)
15. Upper rows should completely cover doors and windows, preferably with a single sheet. If using two pieces, the seam should be at least 6” inside window/door framing.
16. For narrow strips (posts, window openings, wall ends, sliding closet openings, etc.) fasten with 2 screws at each end and stagger in-between 12-16” apart
17. Cover ALL exposed wall foamboard (except in sill box area)
18. For outside corners install to corner edge of framing (up to 1/8” short) do NOT overlap sheetrock

#### Installation On: Walls

19. Start installation on top row of interior wall at intersection of exterior wall (or at an exterior wall corner). Finish top row before starting bottom row on each wall. Keep screws 1 ½” down from ceiling rock
20. Measure to determine starting piece length required for each row to ensure opposite end piece is not too short. Joints must be centered on a stud. All sheets must be fastened with three rows of screws
21. Cut piece, position tight to wall studs and secure with enough screws (at least 10) to hold in place
22. Mark stud center lines for screws using T-square, roto zip as needed and finish installing screws
23. Be sure thermostat and door chime wires (BUT NOT VANITY WIRE) are pulled thru the poly
24. Use sheetrock scrap as spacers in basement and knee walls to keep ½” off of concrete floor
25. Use 8” – 12” sheetrock scraps to cover interior horizontal wiring in unfinished side of basement
26. Quality check all sheets (refer to Quality Points on back side) and mark “OK” with scrap sheetrock. Begin quality checks as soon as each individual sheet has been installed
27. Do not cover joist hangers below stairway closet platform with sheetrock
28. Replace stairway handrail when as soon as stairway is sheet rocked
29. Keep all sill screws 2” in from window.
30. Cut & install four window frame pieces. Install sill & top first, then sides. Screws (NOT THRU PAN - stay 2 ½” from window frame)
**Quality Points**

**Chapter 14 – Wall Sheetrock**

- All wall sheetrock pieces are installed. All foamboard—except in sill box area—is covered with sheetrock
- Joints are staggered a minimum of 2 and preferably 3 studs
- Minimum length - no pieces shorter than 3 rows of screws (exception-closet side walls)
- If more than one piece covers the upper half of windows/doors, seam is at least 6” inside the framing
- All interior penetrations (electrical boxes, cold air returns, plumbing, attic scuttle, bath fans, etc.,) have been cut out (verify via house plan and marks on the floor)
- Furnace thermostat and doorbell chime wires have been fed through the sheetrock. Vanity wire has not
- Sheet rock edges on outside corners and sills do not extend beyond the edge of framing corner (up to ¼” short of corner is ok)
- Basement sheetrock is installed ½” off floor
- Sheetrock below stairway closet platform is not covering joist hangers
- All sheets have been quality checked and verified “OK”

Window frame pieces for are straight no bulges; tops and sides are parallel.
- Stairway handrail has been re-installed
- Wiring between studs on the interior walls of the unfinished side of the basement is covered
- Full leftover 8’ sheets from basement are brought upstairs for return to supplier
- Usable scraps (< full sized sheet) are under stairs, set on by 2X scrap.
# Quick Reference Guide

**March 2022**  
**Version 22.0**

## Chapter 15 – Painting, Staining

### Preparation

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Determine a painting plan.</td>
</tr>
<tr>
<td>2.</td>
<td>Cut poly for use as protection from unruly paint/stain. See Table 15-1 for sizes and function</td>
</tr>
<tr>
<td>3.</td>
<td>Ready some small paint pails, roller pans and liners. Set near paint supply</td>
</tr>
<tr>
<td>4.</td>
<td>Open windows for fresh air.</td>
</tr>
<tr>
<td>5.</td>
<td>Dust off window sills and edges above tub/shower before priming</td>
</tr>
<tr>
<td>7.</td>
<td>Protect tub/shower. Cover shower flange with tape/poly.</td>
</tr>
<tr>
<td>8.</td>
<td>Verify window frames have been covered with painters’ tape. If not, cover frames</td>
</tr>
<tr>
<td>9.</td>
<td>Turn on all lights</td>
</tr>
<tr>
<td>10.</td>
<td>Use drill/paint mixer to thoroughly mix paint. Use a tapered shim to mix stain.</td>
</tr>
<tr>
<td>11.</td>
<td>Place poly on floor where paint is to be mixed or poured.</td>
</tr>
</tbody>
</table>

### Priming, Painting and Staining

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>13.</td>
<td>Do not prime or paint garage ceiling or plastered sheetrock in a garage.</td>
</tr>
<tr>
<td>14.</td>
<td>Prime ceilings before walls</td>
</tr>
<tr>
<td>15.</td>
<td>Prime walls, ceilings, and scuttle hole cover with one coat of primer using rollers</td>
</tr>
</tbody>
</table>
| 16. | Use brushes to cut in all corners and surfaces inaccessible to rollers.  
   a. Do not leave lap marks. Roll out drips and lap marks to eliminate heavy streaks on plaster  
   b. Wipe off splatter on doors, hinges, strike plates, etc. with a damp rag before paint dries. |
| 17. | Hold primer and paint back 1” from edges of exterior doors. |
| 18. | When cutting in ceiling and wall corners, paint a 3” wide border on each side of corner |
| 19. | Remove painter’s tape as soon as possible after painting, but **leave window frame tape on** |
| 20. | Scrape roller covers and brush primer from pans and pails. Transfer leftover primer back to supply |
| 21. | Re-use scraped primer roller covers and cleaned brushes for painting. Replace pan liners and small pail liners before painting |
| 22. | Finish coat walls, ceilings, and scuttle cover using same techniques as for priming. |
| 23. | After painting, check for lightly coated areas using portable lights held 1’- 2’ from surface. Touch-up as needed. |
| 24. | Stain closet poles and stair handrail and skirt boards |
| 25. | Prime and paint scuttle hole trim |

### Clean-Up

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>26.</td>
<td>If painting can’t be completed in a day, wrap rollers and brushes tightly in plastic or foil for re-use</td>
</tr>
<tr>
<td>27.</td>
<td>Scrape roller covers and brush paint from pans and pails. Transfer back to supply</td>
</tr>
<tr>
<td>28.</td>
<td>Dispose of all roller covers and pan and pail liners, as well as pans or pails with excessive paint build-up</td>
</tr>
<tr>
<td>29.</td>
<td>Give brushes to site leader to evaluate for keeping versus disposal. Clean those suitable for re-use.</td>
</tr>
<tr>
<td>30.</td>
<td>Leave window tops under eaves and along front porch open 1” before leaving, weather permitting.</td>
</tr>
<tr>
<td>31.</td>
<td>If floors are covered with paper, remove all paper being careful not to get any spilled paint on the subfloor.</td>
</tr>
</tbody>
</table>

### Preparation for Next Build Day

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>32.</td>
<td>Secure covers on leftover primer/paint buckets, mark approximate leftover volume on covers, leave covers off empty buckets</td>
</tr>
<tr>
<td>33.</td>
<td>Leave all primer and paint buckets inside house</td>
</tr>
</tbody>
</table>
Quality Points

Chapter 15 – Painting, Staining

- Inside of exterior doors, shower stall flange, and tub/shower are clean of any paint
- Tape around window frames is in place and paint cleaned from glass surfaces
- All painted surfaces have been quality checked and touched up as necessary
- Stair skirt and stair handrail are stained, and quality checked
- All painter’s tape (except on window frames) and poly covers removed from doors
- All residual paint has been returned to containers, containers sealed, and marked with approximate volume. (Half full, quarter full, etc.) Empty containers are left open and set aside.
- Any paper floor covering is removed
# Chapter 16 – Installing Handrail

<table>
<thead>
<tr>
<th>Installing the Handrail</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. At the top and bottom stair treads, measure vertically 31” above the nose of the treads and mark the wall. Pull a string line very tight between these marks. This line represents the location of the bottom holes in the three handrail mounting brackets and will place the top of the handrail about 35” above the stairs (must be between 34”-36”).</td>
</tr>
<tr>
<td>2. Along this line, mark the wall for locations of the top and bottom handrail brackets. Locate the top bracket 10-12” from the top end of the stairway wall and the bottom bracket 10-12” from the bottom end of the stairway wall, or from door trim if present. Install handrail brackets at both top and bottom locations.</td>
</tr>
<tr>
<td>3. Cut the handrail to a length such that each end will be 2”-3” from the end of the wall or door trim. With the flat side of the handrail firmly on the bed of the saw, cut opposite 45º miters on each end of the handrail.</td>
</tr>
<tr>
<td>4. Before attaching the handrail to the top and bottom brackets, locate the center of the handrail and attach the middle bracket to the flat underside at this location.</td>
</tr>
<tr>
<td>5. Set the flat side of the handrail on the top and bottom handrail brackets in the position defined in Step 4 and attach the handrail clips to the bottom of the handrail.</td>
</tr>
<tr>
<td>6. Sight along the handrail and raise and lower the center bracket along the wall until any bow in the rail is minimized. Screw the middle bracket to the wall.</td>
</tr>
<tr>
<td>7. Cut opposite 45º miters on a piece of handrail approximately 15-18” long. Move the handrail mounting brackets under the handrail to their farthest positions from the wall. Measure from the long end of the miter to the wall at each end (the distances may not be the same) and carefully cut two pieces these lengths from the short, mitered piece.</td>
</tr>
<tr>
<td>8. At each end of the rail apply wood glue to the miter cuts of both the handrail and the return piece. Set the return piece in place, and hold in place with a clamp. If necessary, wedge a tapered shim between the wall and the end of the return to ensure good contact at the glue joint.</td>
</tr>
<tr>
<td>9. Predrill the miter joint and screw the return to the rail using one screw in each direction, with a slight vertical offset. Wipe off excess glue and putty the holes. If the return is not tight to the wall, loosen the screws holding the bracket to the rail, push the return tight to the wall, and retighten the screws.</td>
</tr>
</tbody>
</table>
Quality Points

Chapter 16 – Installing Handrail

- Handrail is straight and any bow is minimized
- Top and bottom handrail returns are tight to the wall
- Brackets are secure to wall and bottom of handrail
- Top of the handrail is at between 34” – 36” above the nose of the stair treads
# Chapter 16 – Installing Skirtboards

<table>
<thead>
<tr>
<th>Installing Skirtboards</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Scrape wall surfaces behind the stair stringers and clean off any dirt or plaster on the 2x4 on either side of the outside stringers.</td>
<td></td>
</tr>
<tr>
<td>2. On both sides at the top of the stairway, cut a 1” wide notch in the subfloor overhang, flush with the header. Using a square, draw a 4” long plumb line on the wall aligned with the face of the header.</td>
<td></td>
</tr>
<tr>
<td>3. On both sides at the bottom of the stairway, use a level to draw about an 8” plumb line 4” from the end of the stringer.</td>
<td></td>
</tr>
<tr>
<td>4. On one side of the stairs, lay the 24” side of a framing square on the 2x4 next to the outside stringer. Make two marks 11½” up from the 2x4 about 3’ apart at each end of the stairway. Repeat on the other side of the stairway.</td>
<td></td>
</tr>
<tr>
<td>5. On one side of the stairs, place a 6’ level on the two marks at the top of the stairway (from Step 4) and scribe a line across the two marks to a point that intersects the plumb line from Step 2 (this will be Point 1). Using the two marks at the bottom of the stairway (from Step 4), draw a line to a point that intersects the plumb line from Step 3 (this will be point 2). Repeat on the other side of the stairway.</td>
<td></td>
</tr>
<tr>
<td>6. On one side of the stairs, measure from Point 1 to Point 2. Then, measure from Point 2 straight down to the floor. This measurement minus ¼” is the dimension to Point 3. Subtract another ¼” if there will be hard flooring at the bottom. If the DriCore is not yet installed, subtract another 3/4”. Repeat on the other side of the stairway.</td>
<td></td>
</tr>
<tr>
<td>7. Compare measurements from both sides of the stairway. If the measurements on each side are different by more than ¼”, make the adjustments described in the Construction Manual.</td>
<td></td>
</tr>
<tr>
<td>8. If the bottom of the skirtboard ends close to an outside corner or door opening, adjust the length as described in the Construction Manual.</td>
<td></td>
</tr>
<tr>
<td>9. Locate the Skirtboard Template and if necessary, adjust angles to be cut at the top and bottom of the stairs with an adjustable bevel as described in the Construction Manual.</td>
<td></td>
</tr>
<tr>
<td>10. Mark the unfinished side of a skirtboard with the length along the top of the skirtboard and top and bottom angles using either the Skirtboard Template or the adjustable bevel angle, if necessary.</td>
<td></td>
</tr>
<tr>
<td>11. Transfer the Point 2 to Point 3 measurement (from Step 6) to the bottom angled line from Step 10. Create a 90-degree corner with a pencil line at Point 3.</td>
<td></td>
</tr>
<tr>
<td>12. Recheck all measurements then cut the first skirtboard with unfinished side up. Test fit on both sides of the stairway. After confirming proper fit, use the first skirtboard as a template to cut the second skirtboard. Confirm proper fit of second skirtboard.</td>
<td></td>
</tr>
<tr>
<td>13. Stain both ends of each skirtboard.</td>
<td></td>
</tr>
<tr>
<td>14. Prior to placing the skirtboard in position, measure from the final Point 1 to the floor and mark the upper edge of the skirtboard at this dimension down from the peak. Drive a 2-1/2” finish nail into the end, leaving about ½” exposed. This will provide a “handle” to help lift the board into position.</td>
<td></td>
</tr>
<tr>
<td>15. Place the skirtboard in position so both ends match with Points 1 and 2 (from Step 5). Hold the skirtboard off the basement floor using DriCore and/or ¼” spacer depending on type of basement flooring to be installed.</td>
<td></td>
</tr>
<tr>
<td>16. Nail the skirtboard to the wall with 2-1/2” collated finish nails. Putty the nail holes.</td>
<td></td>
</tr>
<tr>
<td>17. Repeat steps 14-16 for the opposite skirtboard.</td>
<td></td>
</tr>
</tbody>
</table>
Quality Points

Chapter 16 – Installing Skirtboards

- Skirtboard is stained on both ends
- At the top of the stairs, Skirtboard is seated firmly into the notch in the floor
- Skirtboard covers any layout pencil lines on the wall
- Top and bottom skirtboard angles are parallel
- Proper spacing exists between bottom horizontal cut of skirtboard and basement floor (1/4” for unfinished floor, 1” if floor to be finished with DriCore)
Chapter 16 – Installing Stair Treads and Risers

<table>
<thead>
<tr>
<th>Installing Stair Treads and Risers</th>
<th>1. For safety reasons, only remove the temporary treads from one step at a time and make certain that the stairway gap is never unattended.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Starting at the bottom of the stairs, measure between the skirtboards to get the length of the riser. If the stairs are going to be carpeted, cut the riser ½” short. If the stairs are not going to be carpeted, cut the riser 1/8” short.</td>
</tr>
<tr>
<td></td>
<td>3. The riser should be flush or slightly under the horizontal cut in the stair stringer that will support the tread immediately above it. Rip to width if necessary.</td>
</tr>
<tr>
<td></td>
<td>4. Center the riser between the skirtboards and secure the riser to the stringers with two 1-5/8” exterior screws in each stringer.</td>
</tr>
<tr>
<td></td>
<td>5. Starting at the bottom of the stairs, measure between the skirtboards using the same process as Step 2, to establish and cut the length of the tread.</td>
</tr>
<tr>
<td></td>
<td>6. Verify the tread has a 1-1/4” overhang from the riser immediately below it. Rip to width if necessary.</td>
</tr>
<tr>
<td></td>
<td>7. Apply a bead of construction adhesive on the three stringer sections. Place the tread on the stringers and drill three 5/32” pilot holes through the tread and into each stringer. Secure the tread using 2½” exterior screws.</td>
</tr>
<tr>
<td></td>
<td>8. After a tread is installed, remove the temporary tread from the step immediately above it.</td>
</tr>
<tr>
<td></td>
<td>9. Repeat Steps 2 – 8 for each riser and tread, proceeding up the stairway. Cut no more than 2-3 tread and risers at a time to length, in case distance between the skirtboards varies along the stairway.</td>
</tr>
<tr>
<td></td>
<td>10. For the topmost tread, about ¾” will need to be ripped from the tread to achieve the 1-1/4” overhang from the riser immediately below it. No riser is required above the top tread.</td>
</tr>
</tbody>
</table>
Quality Points

Chapter 16 – Installing Handrail

- Treads have 1-1/4” overhang from the riser immediately below them.

- Treads and risers are centered between the skirtboards with the appropriate gap on either side (if stairs to be carpeted – ¼” gap, if not carpeted – 1/16” gap

- Risers are attached to stringers with two screws per stringer

- Treads are attached to stringers with three screws per stringer
# Chapter 18 – Installing Swinging Doors

## Door & Opening Prep

1. Check door/frame for damage. If damaged, notify Construction Supervisor or Site Leader.
2. Verify door and size. Check house plan for swing and floor (carpet or hard flooring).
3. Check Jack/King studs for excessive twist. If clearly out of square adjust with shims during installation.

## Adjust Hinge Side Jack Stud

4. Mark location of hinges on hinge and strike side Jack studs.
5. Measure door frame at the head jamb and rough opening at top/bottom hinge locations
   - If difference at either location <= 5/8” add a ¼”x3”x5” shim to the top & bottom hinge locations and go to step 7 below. Otherwise continue to step b.
   - Nail (with 1 ¼” finish nails) **combination** of 1/8” or 1/4”x3”x5” shims at top & bottom hinge locations until difference is <5/8” at both locations
   
   *NOTE: All 3”x5” shims should be placed w/5” dimension vertical & minimum 1/8” shim at each location*
6. Check if plumb with a 6’ level, IF PLUMB:
   - Move level against shims, install flat and/or tapered shims at middle until flush with level.
   - Proceed to Step 9
7. If NOT PLUMB
   - Place level against shims and shim top/bottom hinge areas until it is plumb
   - Install flat and/or tapered shims at middle hinge location until flush with level

## Adjust Strike Side Jack Stud

8. Add layers of 1/8” or 1/4” spacers/shims to strike side Jack stud at top/bottom hinge locations until difference in opening is <3/8”
9. Place level against spacers and Install spacers/shims at middle hinge area until flush with level

## Temporarily Secure Door

10. Set door in rough opening, tight to hinge side Jack stud. If in carpet area (see House Plan), insert scrap floor trim under each side jamb. Otherwise, set directly on hard finished flooring
11. Center hinge side jamb between both wall surfaces
12. Using shims against the head jamb, temporarily wedge door against hinge side with horizontal pressure
13. Check that head jamb left/right reveals are equal. Shim hinge or strike jamb up or down as needed
14. Verify that bottom of hinge jamb is still centered between wall surfaces.
   - Add spacers/shims at bottom of jamb and **temporarily** secure it with one 2½” collated nail above the spacers/shims.
   - Do the same for the strike side jamb.
15. Recheck hinge side is still plumb, centered between wall surfaces
16. Verify consistent door stop contact, adjust side jambs as needed

## Permanently Secure Door

17. With door still tight to hinges side jamb, secure with one 2½” collated nail at each hinge location on one side of doorstop and through shims.
18. Re-check plumb (on hinges) and jamb centered in wall. Adjust as required.
19. Replace one short screw in top hinge with #8 3” brass screw. Adjust for equal head jamb reveals.
20. Recheck door operation and head jamb reveal. Adjust strike side jamb up/down as needed
21. Verify uniform contact with door stop, latch & strike alignment, jambs centered within wall (max 1/8” past/shy of wall surface. Adjust as required.
22. Check reveals at top and bottom of hinge jamb
   - Shim top as required so top reveal equals reveal below top hinge. Secure with 2½” collated nails on one side of doorstop.
   - Shim and nail bottom of hinge jamb until reveal equals top reveal.
23. Check reveals at top and bottom of strike jamb (**minimum** 1/8”). Shim and nail at the bottom of jamb until equals top reveal.
24. Install and nail (same side of doorstop) remaining shims: latch side top & bottom hinge locations; above the latch location.
25. Install shims in center of head jamb, adjust for consistent reveal across jamb, and nail on one side of doorstop.
26. Re-verify contact between door and doorstop at head jamb and strike jamb. Tap 2x4 scrap or spacer on jamb (<1/8” from plaster) and/or doorstop to adjust. **Last resort:** remove/re-install doorstop.
27. Install and nail additional shims between hinge locations, strike and hinge side (total 6 sets of shims each side). Adjust for uniform reveals.
28. At all shim locations, nail at opposite side of doorstop.
29. Recheck complete door operation and reveals and adjust if required.
30. Install Door Trim, lockset and door stop
31. Set and putty all nail holes.
<table>
<thead>
<tr>
<th>Quality Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 18 – Installing Swinging Doors</td>
</tr>
</tbody>
</table>

- Verify install for hard flooring or carpeted area
- Door opens and closes freely and latches snug to striker plate and against door stop
- Uniform reveal at top and sides between door and jamb
- Door trim fits tight to jamb (NO GAP) and is nailed properly (check visually and with “TAP TEST”) and uniform consistent reveal on ALL jambs (sides and top)
- Tight fitting and GLUED miter joints
- All nails set and puttied
- Appropriate door stop installed
### Chapter 18 – Installing Sliding Doors

#### Door Opening and Preparation

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Before removing packaging, check doors and frame for damage. If damaged, notify Construction Supervisor (CS). Check to see if doors have been predrilled for door pulls. If they have, pairs will have holes at opposite edges.</td>
</tr>
<tr>
<td>2.</td>
<td>Select pairs of doors that match in visual appearance (grain pattern, color) &amp; correct door pull locations, etc.</td>
</tr>
<tr>
<td>3.</td>
<td>Put two doors together and check for bow. Plan to install with concave faces together, best side toward the room.</td>
</tr>
<tr>
<td>4.</td>
<td>Confirm: Door Ht. is 80”; rough opening Ht. at both ends is ~ 83”; header is level within 1/8”. If not, see CS.</td>
</tr>
<tr>
<td>5.</td>
<td>Check Jack stud and flush wall for plumb and gaps. If out of plumb by 1/8” or if any gap exceeds ½”, notify CS.</td>
</tr>
<tr>
<td>6.</td>
<td>Install track 2” back from room side wall surface and attach with three 2½” wafer-head screws – middle &amp; both ends. Orient track with roller grooves toward the rear of the closet.</td>
</tr>
</tbody>
</table>

#### Install Door Hardware

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.</td>
<td>Decide which door will be placed in front and rear position in the track. The front door edge should not be visible when entering the room.</td>
</tr>
<tr>
<td>8.</td>
<td>Place doors on horses, room side up. Protect with padding. Install door pulls. Use a piece of wood to protect the pulls and hammer into holes. If pull holes are not present, use a ¾” Forstner bit and drill 36” up from the bottom and 1½” in from the wall edge.</td>
</tr>
<tr>
<td>9.</td>
<td>Turn doors over and install hangers by hand tightening a screw in the single hole and the top of the long slot in each hanger. Shallow offset are for the front door; deep offset are for the rear. Install 2” from the door edges.</td>
</tr>
<tr>
<td>10.</td>
<td>Hang the doors by tilting the top of door inward into the closet. Install rear door first by engaging rollers in the groove at the back of the track, then the front door in the groove at the inside front of the track.</td>
</tr>
<tr>
<td>11.</td>
<td>Close the doors. At the middle of each door, measure the gap from the bottom of the door to the floor. Gap for future carpeted areas should be 1” – 1 3/8”; for finished (installed) floors the gap should be 3/8” – 5/8” (add ¼” if finished floor has not yet been installed). Make sure doors are in correct position (door pulls are next to the walls) and loosen the screws slightly to adjust doors so the door edges make uniform contact with the walls and the floor-door gap is within above specifications. Note: If floor trim has already been installed, install top and bottom bumpers (see step 25) and adjust door hangers so wall/trim contact is made with both.</td>
</tr>
<tr>
<td>12.</td>
<td>If doors have been adjusted to their highest position and floor-door bottom gap is less than the lower limit, the door may have to be cut off. If so, see the SL or CS for direction. If doors have been adjusted to their lowest position and the gap is greater than upper limit, remove the doors and track and install a shim above the track of proper thickness to bring the gap within limits. Note: If cutting a shim for doors over a finished (installed) floor, target shim thickness to provide a gap of 3/8” in favor of the range of 3/8” – 5/8”.</td>
</tr>
<tr>
<td>13.</td>
<td>Verify the door edge-to-wall contact is uniform top-to-bottom, the door-to-floor gap at the middle of the closed doors is within specification and add the third screw to each hanger at the BOTTOM of the short slot.</td>
</tr>
</tbody>
</table>

#### Install Door Track and Hang Doors

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>14.</td>
<td>Finish screwing the track to the header using a 2½” wafer-head screw in every other hole.</td>
</tr>
<tr>
<td>15.</td>
<td>Cut a ¾” x 1 ¼” pine strip. With the ¾” face against the track, nail the strip to the header using 2½” collated finish nails.</td>
</tr>
<tr>
<td>16.</td>
<td>For doors over future carpeted areas, flat shims have to be installed to support the sliding door guide. Obtain a door guide from the Finish Door Kit. Make a pencil line on the floor at the midpoint of the opening. Keep doors closed and slide two layers of 5” x 6” x ¼” shims under the doors. Verify the gap between the bottom of the doors and the top of the shims at the middle of each door is between ¾” and 7/8”. If adjustment is needed, use the appropriate mix of ¼” and 1/8” shims. Note: If 5” x 6” shims are not available, use sets of 3” x 5” shims and tape together with painter’s tape. <strong>For doors over finished flooring, skip to steps 20-23.</strong></td>
</tr>
<tr>
<td>17.</td>
<td>Move both door panels tight to the Jack stud side of the closet. Center the shims on the midpoint mark, oriented so the 5” dimension is parallel to the doors.</td>
</tr>
<tr>
<td>18.</td>
<td>Adjust the sliding door guide to fit the thickness of the doors and slide it under the door edges and center it on the 5x6 shims. Keeping the shim centered on the midpoint and the guide centered on the shim, move the spacers blocks and the doors until the reveal between the door and the corner of the wall is uniform from top to bottom. Nail the shims to the floor with a 1 ¼” collared finish nail in each corner. If 3” x 5” shims are used, nail four nails in each 3” x 5” piece. Remove door guide and put it on the windowsill with screws provided with the door hardware.</td>
</tr>
<tr>
<td>19.</td>
<td>Finished floors have door guides installed directly to the flooring. Close both doors and verify that the door-to-floor gap at the middle of each door is 3/8” – 5/8”, and both doors have uniform contact with the wall (or both top and bottom door bumpers touch the wall/trim if floor trim has already been installed.)</td>
</tr>
<tr>
<td>20.</td>
<td>Locate the door guide supplied with the doors (Do NOT use a door guide from the Finish Door Kit).</td>
</tr>
<tr>
<td>21.</td>
<td>Move both door panels tight to the Jack stud. Adjust the sliding door guide to fit the door thickness and slide the door guide under the opposite door edges. Align the left side of the guide flush with the door edges. Move the guide and doors until the reveal between the front door panel and the wall corner is uniform from top-to-bottom.</td>
</tr>
</tbody>
</table>
22. Drill two 1/8” diameter pilot holes through the door guide mounting holes into the flooring and fasten the guide to the floor with two of the screws provided with the door hardware.
23. Measure the width of the opening at the track and cut a piece of floor trim to that length. With the square edge tight to the plaster, nail with 1 ¼” **collated finish nails**. Keep nails 3” away from the edges to avoid splitting. Fill nail holes with putty.
24. Install bumper pads (located in the Finish Door Kit. Attach 1” DIA x 3/8” felt pads at the top of the vertical edges of each door and 1” DIA x 1/8” vinyl pads at the bottom edges of each door.

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### Quality Points

**Chapter 18 – Installing Sliding Doors**

- Two doors match in visual appearance
- Over finished flooring (hard flooring) gap between bottom of doors and the floor is between 3/8” – 5/8”
- Over future carpeting, gap between bottom of doors and 5” x 6” x ¼” spacers is between ¾” – 7/8”. Shims have been nailed to the floor with 1 ¼” collated finish nails. Door guide from Finish Door Kit has been left on the windowsill along with mounting screws
- Doors installed over finished flooring slide easily in door guides
- Door edges contact the walls uniformly from top to bottom (or bumper contact is made to wall/trim if bumpers installed)
- Door(s) against Jack stud(s) show uniform reveal from top to bottom
- Floor trim piece has been installed with the square edge tight to the plaster and ends snug to the side walls, using 1¼” collated finish nails. Holes have been putted.
- Doors slide easily and smoothly after nailing trim piece
- Door pulls have been installed at correct height and distance from the door edges.
- Front door edge is not visible when entering the room.
- Track has been secured with 2 ½” wafer-head screws in every other mounting hole
# Quick Reference Guide

## March 2022

**Version 22.0**

## Chapter 19 – Installing Floor Trim

| Preparation | 1. Make sure all door trim has been installed  
|             | 2. Mark studs on floor if not already done  
|             | 3. Scrape excess plaster from wall near the floor, pay particular attention to corners  
|             | 4. In carpeted areas, use scrap floor trim pieces (¼”) to hold trim off the floor  
|             | 5. In areas with hard flooring, install trim directly on and tight to the finished flooring. Hard flooring must be in place before installing trim  
|             | 6. Do not install trim in kitchen or bathroom until cabinets are in place. |

| General Instructions | 7. Establish a plan for each room, deciding where trim must be cope or mitered. It is usually best to start on a wall with two inside corners that can be cut with straight end cuts.  
|                     | 8. Avoid trim pieces with both ends cope or one end cope and the other beveled, if possible.  
|                     | 9. Run trim under cold air return vent covers  
|                     | 10. Cope all inside corners, miter all outside corners. Glue all mitered corners  
|                     | 11. Bevel splices with matching 22.5° cuts arranged so overlap is angled away from room viewing area and with the overlap falling 2” away from the edge of a stud. Glue ends of the splice before nailing  
|                     | 12. Set all nails and fill holes with putty |

| Installation | 13. Use 2¼” collated finish nails, nail about 1” into top of floor trim into each stud  
|             | 14. Do not nail square cut ends at corners. The corresponding cope piece should hold these corners tight.  
|             | 15. Use construction adhesive to install very short pieces to avoid splitting the trim  
|             | 16. Trim that transitions from hard flooring to a carpeted area should be held level as the depth of the hard flooring equals the depth of the scrap floor trim used to position trim over carpeting. If a transition strip has been installed over the carpet/hard floor junction, cut the transition strip away from the wall using a scrap piece of floor trim as a width guide.  
|             | 17. Hold trim over hard flooring tight to the flooring |

| Coping | 18. Cut a 45° bevel so that back side of trim is longer than the face.  
|        | 19. Make a 15° relief cut with bottom edge of trim up and face side toward front of saw, blade aligned with intersection of the bevel cut and face of the trim  
|        | 20. Cut down the edge of the flat face leaving the curved edge in place  
|        | 21. Use a coping saw held at a 5° back angle to cut the curved edge  
|        | 22. Smooth or shape as needed for a good fit |
Quality Points

Chapter 19 – Installing Floor Trim

- Trim is tight to hard flooring and spaced appropriately over areas to be carpeted
- All inside corners are coped, all outside corners are mitered. Mitered corners are glued
- Coped and mitered corners are tight to one another with no large gaps
- Splices are beveled and glued
- Trim is not split in any area
- Trim is nailed into each stud and all nail holes are set and puttied
## Chapter 20 – Storm Door, Toe Kick Board, Porch Rails

### Installing Storm Doors

1. Consult with Construction Supervisor to determine the door swing.
2. Remove the door from packaging and check for any damage.
3. Measure the opening between brickmold at the top, middle and bottom of the opening.
4. Refer to the Larsen Door instructions to determine whether flat shims need to be added to reduce the rough opening. If they are, begin by installing strips of $\frac{3}{4}\times1$” flat shims (in construction trailer) on the hinge side of the door frame with trim nails.
5. Follow Steps 2-4c in the Larson Door instructions. Then, temporarily tack the strike side rail on the strike side of the opening and shim the strike side, if needed.
6. Follow the remaining Larson Door instructions.
7. Place a bead of finish caulk on the back side of the door top rail and install it.
8. Install the wind chain.

### Installing Toe Kick Board

9. Remove the temporary threshold support piece.
10. Cut a filler piece of $\frac{3}{4}$” OSB (or two pieces of $\frac{1}{2}$” OSB) to the desired dimensions. Install this tight to the underside of the threshold using eight 3” sheetrock screws.
11. Measure the distance between the two J-channels next to the brickmold and cut the toe kick board material to that length.
12. Determine the desired height of the toe kick board and rip the board material to this dimension.
13. Apply construction adhesive to the filler piece of OSB – around the complete perimeter and from corner to corner.
14. Attach the toe kick board WITH THE GRAIN-FINISHED FACE OUT to the OSB with six 2½” collated finish nails.

### Installing Porch Rails

15. Slide attachment sleeves onto each end of the front bottom railing, center it on the posts and aligned parallel with the siding, and attach the sleeves to the posts.
16. Insert the spindles along the length of the railing.
17. Slide attachment sleeves onto each end of the top railing. Position the top railing so each spindle slides completely into the corresponding slot on the railing. Center the sleeves on the posts and attach.
18. For side railings, position the bottom railing between the house and a post, a slide attachment sleeves onto each end of the railing, align it so it is parallel to the edge of the porch slab, and adjust the height of the railing nearest the house until it is level. Attach the sleeves to the post and the house (being sure not to drive the screws so tightly as to distort the vinyl siding).
19. Insert the spindles along the length of the railing.
20. Slide attachment sleeves onto each end of the top railing. Position the top railing so each spindle slides completely into the corresponding slot on the railing. Attach the sleeves to the post and the house (being sure not to drive the screws so tightly as to distort the vinyl siding).
21. If plugs are available, install plugs over each screw.
Quality Points

Chapter 20 – Storm Door, Toe Kick Board, Porch Rails

- Storm door is installed so that it
  - Has the desired swing orientation
  - Swings freely
  - Latches tightly
  - Is protected with a wind chain securely attached to the head jamb

- Threshold toe kick board is installed:
  - with a ⅛” gap between the bottom of the board and the concrete
  - Glued and nailed (with 2½” collated finish nails) to the supporting filler OSB

- Porch rails are installed with
  - Front rails parallel to the front siding
  - Side rails level and parallel to the edge of the porch slab
  - All spindles securely in their slots
  - Attachment sleeves secured to siding without distorting the siding or centered on posts and secured
  - Plugs, if available, installed over each screw
### Chapter 20 – House Numbers, Mailbox, Sealing Exterior Penetrations

<table>
<thead>
<tr>
<th>Installing House Numbers</th>
<th>1. If house numbers are being installed directly on a porch post, arrange them so they are equally staggered in both the vertical and horizontal directions. The top edge of the first digit is 70” above the porch slab.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. If house numbers are being installed on a board, consult Construction Supervisor for location of the board. If being installed horizontally, arrange the numbers so they are centered horizontally and vertically. If being installed vertically, arrange the numbers so they are equally staggered horizontally and vertically.</td>
</tr>
<tr>
<td></td>
<td>3. Install the numbers on the board with 2½” #10 trim screws.</td>
</tr>
<tr>
<td></td>
<td>4. Attach the board to a post or wall so its top edge is 70” above the surface of the porch or driveway.</td>
</tr>
</tbody>
</table>

| Installing Mailbox | 5. House Mailbox  
|                   | • Determine whether the mailbox is being attached to the siding or the porch rail  
|                   | • If to the siding, locate blocking and attach mailbox to siding at that location roughly 43” above the porch slab using 2½” screws  
|                   | • If to the porch rail, position it near the front of the porch (but not interfering with the opening of the storm door) and with its topmost edge flush with the top of the porch rail |
|                   | 6. Curbside Mailbox  
|                   | • Cut a 36” length of 4x4 treated lumber  
|                   | • Install the 4x4 post stake centered 24” back from street pavement or curb  
|                   | • Insert the 36” piece of 4x4 into the sleeve of the stake and plumb with shims  
|                   | • Install mailbox over 4x4 per manufacturer’s instructions  
|                   | • Install mailbox numbers on both sides of mailbox |

| Air Sealing Exterior Penetrations | 7. Seal any gaps around exterior penetrations, like the following, with finish caulk:  
|-----------------------------------|--------------------------------------------------|
|                                  | • Water heater exhaust  
|                                  | • Furnace intake and exhaust  
|                                  | • Gas line  
|                                  | • Sump pump |
Quality Points

Chapter 20 – House Numbers, Mailbox, Sealing Exterior Penetrations

- House numbers are installed either
  - On a porch post equally staggered vertically and horizontally starting 70” above the porch slab, or
  - On a board mounted horizontally or vertically on a porch post or wall, 70” above the porch slab or driveway

- Mailbox is installed
  - For house mailbox, either secured to blocking behind siding 43” above the porch slab, or attached to a porch rail near the front of the porch but not interfering with the opening of the storm door
  - For curbside mailbox - supporting 4x4 is plumb and solidly attached to the ground and house numbers are applied to both sides of the mailbox

- All exterior penetrations are sealed