

Chapter 13. Ceiling Sheetrock

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Tools needed by volunteers:

Nail apron
Tape measure
Utility knife
Pencil

Materials needed:

½" Sheetrock
⅝" Sheetrock
1¼" Sheetrock screws
1⅝" Sheetrock screws
3½" Sheetrock screws
4" Timber screws
Air sealing tape

Tools and equipment needed:

Extension cord
Lighting
Driver
Screw gun
Sheetrock bit (dimple bit)
Spiral saw
4⅛" Hole saw
Chop saw
Quick clamps
Sheetrock T-square (2' and 4')
Sheetrock rasp
Sheetrock hand saw
Sheetrock lifts
Step ladders/stools
Putty or drywall knives
Ratcheting T-driver
Black felt-tipped pen
Chalk line
Vacuum

Personal Protection Equipment:

Safety glasses (required)
Dust mask (recommended)

Safety First! Review the Safety Checklist before performing tasks in this chapter.

13.1. PREPARATION

1. Verify that the sheetrock supply staged for the house installation is $\frac{1}{2}$ " and not $\frac{5}{8}$ " thick. The $\frac{5}{8}$ " sheetrock is to be used for the garage only.
2. Verify that ceiling blocking has been installed where required. Install where missing. See Section 10.6.3 for sheetrock blocking requirements.
3. Verify that the poly vapor barrier in the corners will not interfere with the installation of sheetrock. Poly should be neatly tucked into corners to allow sheetrock to fit squarely into corners. Poly that is stretched across a corner will inhibit sheetrock from fitting tight to the framing. If poly does not fit tight to corners, pull out staples and refold if possible, or cut poly in the corners and re-seal with air sealing tape. Also check for holes and cover any holes with air sealing tape.
4. Where ceiling trusses cross interior walls, mark the truss center locations on the wall top plate with a felt-tipped pen. Where ceiling trusses cross exterior walls, no mark is necessary - they will be aligned with wall studs.
5. Verify that all ceiling electrical boxes and basement HVAC ceiling ducts and damper locations have been marked with a red circle on the floor (see Sections 12.2.2 and 12.2.3 for marking instructions).
6. Verify that the cutting bits in the spiral saws are not bent and that the bit protrudes no more than the ideal length of $\frac{5}{8}$ "- $\frac{3}{4}$ " beyond the saw guard. If it is bent remove the clamping sleeve and clean the sheetrock dust from the sleeve slots (with WD-40) to ensure adequate clamping pressure. Replace the bit and position the bit in the sleeve with about $\frac{1}{4}$ " of the bit sticking out beyond the base of the sleeve and reattach the sleeve into the spiral saw (see Figure 13-1).

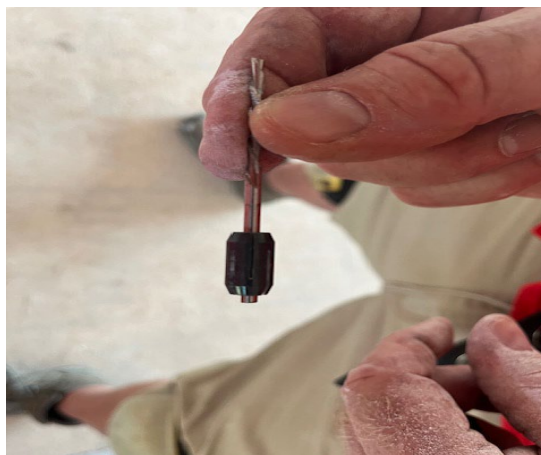


Figure 13-1. Proper Saw Bit Insert Depth.

13.2. PLANNING

1. Develop an installation plan to maximize efficient use of people and material to minimize building costs. When considering the installation plan, keep in mind that the desired minimum sheetrock width is 12" along exterior walls and 16" along interior walls; however, the wider the better along interior walls:
2. Divide the task of installing sheetrock into two functions, with a separate team for each function. Functions include cutting, installing and quality control (see Section 13.5.4 for quality check instructions).
3. Determine the best individual sheetrock widths and lengths required to complete each room (see Sections 13.4.1 and 13.4.2).

13.3. GENERAL INSTALLATION RULES

1. Install all sheetrock perpendicular to the trusses.
2. Butt factory ends to factory ends of adjacent sheets.
3. Ideally, all sheetrock pieces should butt together. Try to limit any gaps to less than 1/8". Maximum allowable gap is 1/4".
4. All sheetrock pieces must be long enough to be attached to at least three trusses or two trusses and end blocking (i.e., each sheet must have at least three rows of screws).
5. House sheetrock is installed with 1 1/4" sheetrock screws; garage sheetrock is installed with 1 5/8" screws.
6. **Screws should be installed straight in (i.e., at a 90° angle to the sheetrock) and deep enough so the head is SLIGHTLY recessed (countersunk) below the paper surface of the sheetrock (see Figure 13-2). If the outer layer of paper is torn, or the gypsum is crushed between the paper layers, the screw is too deep and the holding power of the screw is compromised. Leave the screw in place but add another screw about 2" away. Adjust the depth setting of the driver to ensure the correct depth.**

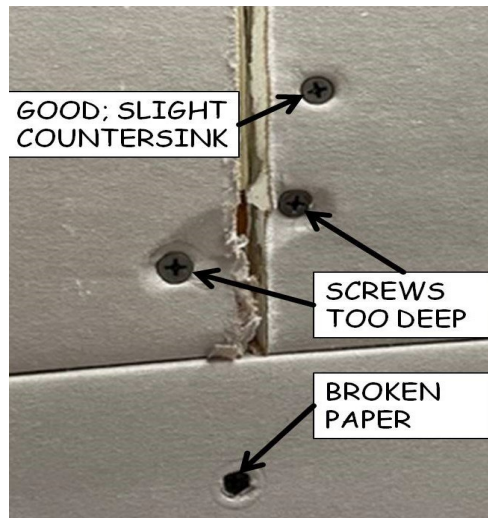


Figure 13-2. Examples of Countersunk Sheetrock Screws.

7. Keep screws 1"-2" away from the corner of the sheetrock to prevent corner cracking.
8. Each full width sheet must be fastened with seven screws on each end and five in the field.
9. Factory edges of sheetrock should butt to factory edges of adjacent pieces wherever possible. Keep cut edges toward the walls.
10. Do not force the sheetrock if the fit is tight. Forcing and mishandling can result in broken corners (see Figure 13-3). Sheetrock with broken corners should not be installed. If tight, trim to fit. If a break occurs during installation, check with the Construction Supervisor regarding acceptability. If it's OK, remove any loose paper and gypsum before completing installation.



Figure 13-3. Broken Corner.

11. End joints on each successive row should be staggered a minimum of two and preferably three trusses.
12. After cutting sheetrock, measure and record the length on the drop and set the drop aside. To maximize efficiency, always check the drop pile first before cutting from a longer sheet.
13. Undercut sheetrock pieces $\frac{1}{4}$ "- $\frac{1}{2}$ ". For fitting between an installed factory end and a truss center or end blocking, undercut the length by $\frac{1}{4}$ " versus the measured gap. However, if the sheet will completely fill the gap between two parallel walls, (e.g., a closet or pantry), undercut the sheet by $\frac{1}{2}$ ".
14. When fastening sheetrock to trusses that cross interior or exterior walls, hold the screws 8"-10" away from interior walls, and about 4"-6" away from exterior walls (see Figure 13-4).

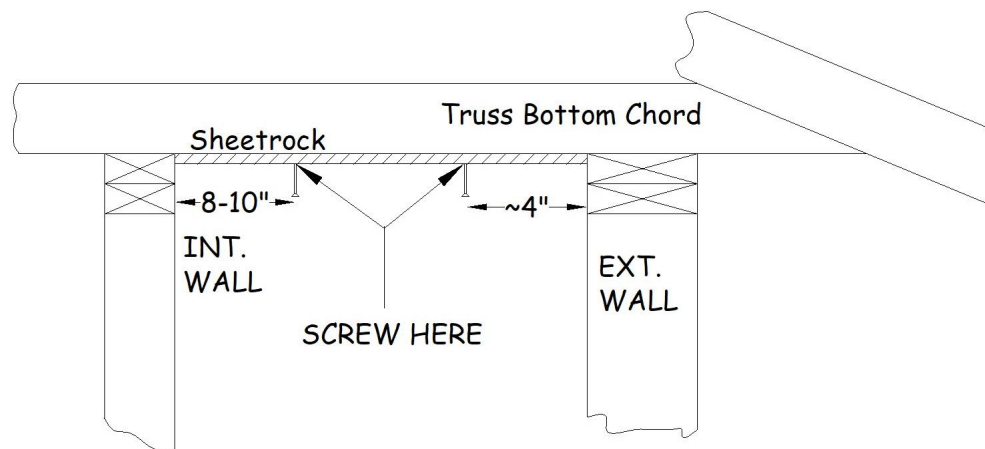


Figure 13-4. Screw Locations for Ceiling Sheetrock.

15. Where the trusses run parallel to the walls, screw into blocking on top of the walls unless a truss is less than 6" from the wall. In this case, screw into the truss since there should be no blocking on the top of the wall.
16. Use a spiral saw to cut out all ceiling electrical boxes (see Section 13.5.6 for marking instructions and Section 13.5.7 for sawing instructions). Sheet rock pieces covering the scuttle access can be cut with a spiral saw or a hand saw. When using a spiral saw, ask someone to run a vacuum and hold the hose end close to the leading edge of the cut to reduce spreading the dust generated by the cutting tool.
17. Prior to sheet installation, cut the fan opening with a hand saw so the perimeter of the cut is flush with the inside edge of the fan opening.

NOTE: Do not use a spiral saw to cut openings for bath fans. The spiral bit will shred the poly tape seal between the fan housing and the vapor barrier and allow moisture to escape into the attic (see Figure 13-5).



Figure 13-5. Damaged Tape Seal from Spiral Saw Cut-Out for Bath Fan.

18. Use a 4 $\frac{1}{8}$ " hole saw to cut an access for basement HVAC adjustment dampers. See Section 13.5.9 for cutting instructions.
19. When cutting sheetrock with a hand saw, always cut facing the finish side (grey side) and cut on the push stroke only. This will prevent paper tear-out on the finish side.

13.4. CEILING SHEETROCK LAYOUT

13.4.1. Bedroom and Bathroom Layout.

1. Measure the room width (parallel to the trusses) from the exterior wall to the opposite interior wall (ignore walls inside closets).
2. Determine the total number of full 4' wide sheets that will fit into the measured length.
3. Subtract the total full sheet width from the room length. If the result is 12" or greater, continue with Step 4. Otherwise, proceed to Step 5.
4. If the result is 12" or greater, start the installation along the exterior wall with a full 4' wide sheet. The row width along the exterior wall will meet the 12" minimum requirement.

EXAMPLE: If room width is 13'-2", three 4' wide sheets will fit into the ceiling area of the room for a total sheet width of 12', leaving a 13'-2" – 12' = 1'-2" or 14" wide row above the exterior wall.

5. If the result is less than 12", trim the first row of sheets to ensure the row above the exterior wall is at least 12" wide.

EXAMPLE: If room width is 12'-6", three 4' wide sheets will fit into the ceiling area of the room for a total sheet width of 12'. Since 12'-6" – 12' = 6", trimming 6" off the first row will provide a 12" wide final row above the exterior wall.

13.4.2. Kitchen/Dining/Living Room Layout.

1. Measure the room width (parallel to the trusses) from the exterior long wall to each of the interior wall sections.
2. Estimate the sheetrock widths required to best fill the ceiling from the exterior wall to the interior walls. Start by figuring to use a full 48" wide sheet along the exterior wall and determine the resulting widths along the interior walls. Remember, sheetrock widths must be at least 16" along interior walls and 12" along exterior walls. If 48" does not provide an adequate width along all the interior walls, adjust the starting width (e.g., 36", 24" or 12") along the exterior wall until the minimum width along all interior walls is satisfied.
3. Add ¼" to the starting width dimension determined in Step 2 above. From the exterior wall top plate, mark this width on the bottom of the first and last truss (located at opposite ends of the room). Snap a line between the marks. This line represents the leading edge of the first row. Check the distance from the outside long wall to the chalk line every 48"- 60" to verify no areas are less than the desired sheetrock width plus ¼". If there are, add ¼" to the truss marks created above and re-snap the line.
4. Determine the total length of the first row by measuring the room length (perpendicular to the trusses). Next, determine how many full-length sheetrock pieces can be used to fill the length and the sizes required for the end sheets. The standard size used for main floor ceiling sheetrock is 12' long; basement sheets are 8' long.

NOTE: Every sheet must be attached to at least three trusses or two trusses and end blocking. Also, all butt joints must be centered on a truss.

13.5. INSTALLING CEILING SHEETROCK

1. Begin installing sheetrock at an exterior wall perpendicular to the trusses.
2. Measure and draw pencil lines across the sheetrock at the truss centerline locations with a 4' T-square. Marking these lines ensures every screw hits a truss. This can be done before placing sheetrock on the lift, or when the sheetrock has been safely secured with enough screws to lower the lift.

3. Use a sheetrock lift to raise, position and hold sheetrock pieces to the ceiling. Extend the horizontal sheet support arms of the sheetrock lift as appropriate for the length of the sheet and lower the two support arms to support the bottom of the sheet. Place the sheet on the lift and raise it until it almost touches the ceiling. For the first row, position the long factory edge along the chalk line snapped in Section 13.4.2.3 for the large open room or tight to the wall for bedrooms and bathrooms. **Make sure the factory end is centered on a truss.** Safely secure with several screws in at least four trusses (ends and middle) before lowering the lift. Continue installing all pieces in the first row along the chalk line before moving to the next row.
4. Conduct the quality control checks listed below on **every screw**. When completed, mark “OK” on every sheet with a piece of sheetrock used as a chalk.

NOTE: Never write on sheetrock with marking crayons or felt tipped marking pens.

TIP: Conducting quality checks as soon as each individual sheet is installed is preferred over waiting until a room is complete. This helps identify any bad habits or equipment problems early in the installation process and helps ensure that the quality checks are not rushed at the end of the workday

- a. Use a putty knife to make certain the head of each screw is recessed below the surface of the sheetrock (a slight dimple is best). Slide the putty knife along the sheetrock surface and move it over every screw. Listen for a “click”. **If a screwhead is exposed, tighten until slightly recessed.**
- b. If a screw “spins” during driving or seems loose during tightening, it is not secured to a truss or blocking and must be removed and relocated.
- c. **If the screwhead or dimple bit is too deep, (e.g., it has completely broken the exterior paper layer of the sheetrock or crushed the gypsum), the holding power of the screw is compromised. Leave the screw in place, but add another screw about 2” away.**
- d. Verify screw count on each full width sheet to ensure there are seven screws on each end and five in the field. Add screws if the actual number is short of the desired count.
- e. Remove and relocate any screws located less than about 8”-10” from an interior wall or 4” from an exterior wall where trusses run perpendicular to that wall.
- f. Verify any loose or torn paper from the interior face of the sheetrock has been removed.
- g. Verify any installed sheetrock with a broken area has been approved by the Construction Supervisor and loose gypsum has been removed.

5. After completing the first row, continue to the next row (adjacent where the first row ended). Start with a full sheet, if possible, but select a length that will allow for a joint stagger of at least two and preferably three trusses.
6. Before covering electrical boxes and scuttle access with sheetrock, measure from the center of the box to the edges of two adjacent surfaces oriented 90° to each other. Write these dimensions on an adjacent panel or scrap piece for reference when cutting out the opening. Install the sheetrock over electrical box openings with enough screws to hold the panel. To prevent driving screws through the sheetrock, do NOT fasten within 24" of electrical boxes until after the box opening has been cut. Mark the centerlines on the sheetrock after covering the box.
7. Use a spiral saw to cut around all electrical boxes. Verify that the depth of the saw bit is $\frac{5}{8}$ "- $\frac{3}{4}$ ". Insert the saw bit 3"-4" away from the box mid-point and move it horizontally until resistance from the outside edge of the box is encountered. Then proceed to move the bit counterclockwise around the outside perimeter of the box. Moving the saw in a counterclockwise direction helps hold the saw bit against the outside surface of the electrical box.

NOTE: It is important to keep the bit outside the electrical boxes to prevent cutting the wires. If a wire is cut, or insulation is damaged, report it to the Construction Supervisor.

8. When using a spiral saw to cut the scuttle opening, insert the bit near the scuttle frame, work the bit toward the framing, and cut counterclockwise around the inside edge of the framing.
9. Measure and cut out holes for damper access prior to sheet installation to prevent cutting the sheet metal. Determine the center of the damper control lever from two adjacent references, transfer the center to the sheet, and cut with a $4\frac{1}{8}$ " hole saw. Verify adequate access before securing the sheet.

NOTE: Damper access holes will be plugged with a standard hole plug that has a $\frac{1}{2}$ " flange on the outer perimeter of the plug. Keep the hole center a minimum of $2\frac{3}{4}$ " from a wall or LAM beam to ensure adequate clearance for the flange.

10. When installing ceiling sheetrock in the garage, drill a ¼" hole near the ceiling outlet and pull the wire for the garage door opener through the hole (see Figure 13-6).



Figure 13-6. Exposing Garage Door Opener Wire.

11. After completing the ceiling installation in the garage, cover the upper and top plates of the two exterior walls with 3" wide pieces of sheetrock (see Figure 13-7). Do not use pieces shorter than 48" long. If available, use ½" sheetrock scraps.



Figure 13-7. Covering Garage Exterior Wall Plates.

13.6. FINISHING SCUTTLE BOX COVERS

1. Cover the bottom framing of both house and garage scuttles. For each box, measure the width of the scuttle box 2x framing (either nominal 3½" or 5½"). Cut four sheetrock strips, each ¼" narrower than the measured width. Use ½" sheetrock for the house; ⅝" for the garage. Select pieces from narrow drop-offs having a factory edge on one of the long edges. Install them factory side up, flush with the top of the scuttle box framing.

2. If the garage has a scuttle access, retrieve the $\frac{3}{4}$ " decking OSB cover from the scuttle access. If the garage cover cannot be located, check with the Construction Supervisor. If the cover is not found, measure the length and width of the access opening and cut a new cover $\frac{1}{2}$ " inch shorter than the measured dimensions. Cut a piece of $\frac{5}{8}$ " sheetrock to the OSB dimensions, flush up the sides and attach to the OSB with the backing side toward the OSB. Secure with $1\frac{5}{8}$ " sheetrock screws. Set aside for plastering.
3. If the house has a scuttle access, locate the stretch-wrapped $\frac{1}{2}$ " OSB/foamboard cover assembly. It is typically located near the scuttle. If the assembly cannot be located, consult the Construction Supervisor. If the assembly has not been made, see instructions for cutting and stretch-wrapping components in Section 7.6.3, then cut $\frac{1}{2}$ " sheetrock to the same dimensions as the OSB portion of the assembly. Orient the assembly OSB side up, place the backing side of the sheetrock on the OSB, flush all sides to the OSB and attach with $1\frac{1}{4}$ " sheetrock screws. Set aside for plastering.

13.7. INSTALLING FULL HEIGHT END POSTS TO 42" WALLS

1. If the House Plan includes a full height post to support the end of a 42" wall, retrieve the post from underneath the basement stairs. The post is a full floor-to-ceiling length sandwich of two 2x4s and $\frac{1}{2}$ " OSB. If it cannot be located, check with the Construction Supervisor. If the post is not on site, see Section 5.10.3.1 for fabrication directions.
2. Verify the post length. When resting on the sub-floor, the top of the post should contact the bottom of the sheetrock. Trim to length as required with a chop saw.
3. Position the post in front of the 42" wall end stud and verify its length. If necessary, shim the bottom of the post with appropriate shims to ensure the top of the post contacts the sheetrock.
4. Verify the wall is plumb, then loosely quick clamp to the top and bottom of the 42" wall end stud. Plumb the post with a 6' level in both directions. Shim between the end stud and the post if required and tighten the clamps.
5. Verify both wall and post are plumb. Secure the bottom of the post through the 42" wall end stud with three 4" Timber screws. Secure the top of the post with one pair of $3\frac{1}{2}$ " sheetrock screws toe-nailed through each of the 2x4 faces.

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