

New mud- or tape-on corner beads are more resistant to edge cracking and nail pops than traditional metal corner beads.

# REDUCING Drywall Callbacks

Get rid of most pops and cracks with panel adhesive, floating corners, and the right beads and joint compound

**A**t the end of a drywall job, I touch up small defects and do a careful cleanup. Then, before I leave the site, I make a final walk-through with the client. This provides a good opportunity to answer any questions and to show off the quality of the job. With the client as witness, I'm also protected from liability for any damage that may occur as other contractors work on the site, such as the door installer who whacks the ceiling, the electrician who slips with the screwdriver, or the mover who damages the outside corner in the foyer. If any such damage occurs and I get called back to make the repair, I'll get paid.

Every once in a while, however, I may get a call about an edge crack on a corner bead, or a popped screw or nail along the top edge of a wall — particu-

larly after the first heating season, when the framing has dried and settled. Other common callbacks include loosened or buckled tape in the inside corners, ridging of seams on higher walls — a stairwell wall, for example — or visible ridging on a butted seam. Sometimes, after the painting is done, I'll get a call about seams or fasteners showing through as a different texture (known in the trade as photographing or telegraphing). All of these problems can be prevented or greatly reduced and are easy to correct.

## Fastening Drywall

When fastening the drywall, whether with screws or nails, I make certain that the panel is tight against the framing and that the fasteners are properly set (see Figure 1). I use coarse-thread screws for wood

framing and fine-thread for metal. Improper fastener lengths can also cause problems; screws for wood framing should penetrate the framing by  $\frac{5}{8}$  inch and nails by  $\frac{7}{8}$  inch. Much shorter or longer is not recommended. Instead of nails, I use screws whenever possible, because they hold much better and are less likely to damage the drywall as they are being installed. The nose of a drywall screw gun also pushes the panel against the framing and limits the screw to exactly the proper depth just below the surface of the drywall, without tearing the paper or damaging the gypsum core. If a screw is set too deep, though, the panel is more likely to pop loose.

**Other hints.** When drywall panels are force-fit into place, they may bow, which can introduce stress and keep the panel from contact with the framing. This creates the possibility of fastener pops. Misaligned and twisted framing can also contribute to fastener failure. Any fastener that misses or is not securely anchored into the framing member may work loose over time and should be immediately removed (see “Fastener Spacing”).

**Floating corner technique.** Nail or screw pops and cracking in the seams are common along inside corners at wall-to-wall or wall-to-ceiling intersections. These problems are typically caused by settling stresses or truss uplift. One way to reduce problems is to eliminate fasteners along one or both edges of the corner (Figure 2).

On ceilings, place the first screw 7 to 12 inches from the corner along the perimeter of the ceiling. The upper wall panel will support the edge of the ceiling. Screw the upper edge of the top wall panel in place 8 to 12 inches down from the ceiling to avoid fastening to the top plate, where settling may occur. To create a floating corner at a wall intersection, omit fasteners in the corner on the first panel installed. Make sure that the panel edge is supported by proper corner framing, but do not fasten it. Next, install and fasten the abutting corner panel. When taped, the unfastened panel edge will stay secured to the abutting panel, even if the framing pulls away slightly. Screw the remaining ceiling and wall areas using



**Figure 1.** To minimize nail pops, keep the drywall tight to the framing and choose the right length fastener. Screws should penetrate the framing by  $\frac{5}{8}$  inch, nails by  $\frac{7}{8}$  inch. The screw or nail head should indent, but not break, the paper facing.

### Fastener Spacing

Framing Type	Framing Spacing	Max. Fastener Spacing
Ceiling Joists	16 inches o.c.	12 inches
	24 inches o.c.	12 inches
Wall Studs	16 inches o.c.	16 inches
	24 inches o.c.	12 inches

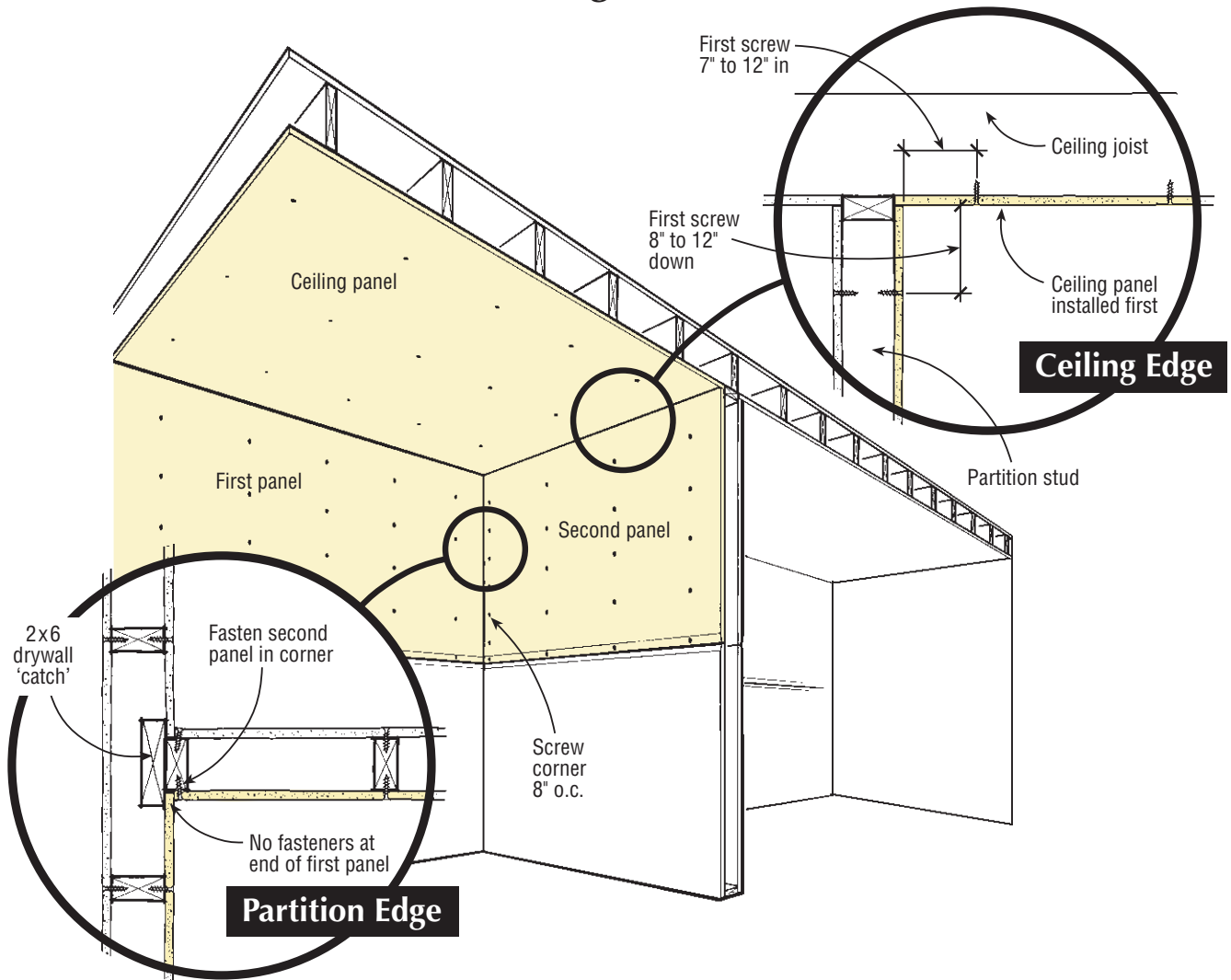
standard fastening procedures.

**Drywall clips.** I usually rely on the screw method to make a floating corner, unless there’s a framing element missing, in which case I’ll resort to clips — I keep a supply handy in my truck. Drywall clips can be used at inside corners to create an equally effective version of the floating corner, while eliminating the need for a third stud on an inside corner or backup framing along ceiling edges (Figure 3). If you use clips on the ceiling-to-wall juncture, the first screws in the ceiling can be kept back 18 inches from the edge.

### Using Adhesive

It takes a lot of fasteners to attach the panels to a ceiling or wall. One way to cut down on the number

## Floating Corners



**Figure 2.** Avoid nail and screw pops at wall-to-ceiling intersections by holding back the fasteners on both the wall and ceiling panels. At wall-to-wall intersections, leave the first panel unfastened in the corner and hold it in place with the abutting panel.

of fasteners is to secure the drywall with an approved ASTM C557 standard drywall adhesive. Application with adhesive is becoming more common — I use it routinely and highly recommend it. By using an adhesive, the number of fasteners needed can be reduced by up to 75 percent. An added benefit is that the adhesive will help to unify and strengthen the structure by increasing the panel's tensile strength by up to 100 percent and its shear strength by up to 50 percent.

When using adhesive, apply a  $\frac{3}{8}$ -inch-wide bead to each framing member to within 6 inches of the edge of the drywall. Install fasteners on 16-inch centers along the perimeter of each panel immediately after hanging it.



**Figure 3.** Drywall clips, installed about 12 inches apart, offer an alternative approach to floating corners and eliminate the need for the third corner stud or backup framing along ceiling edges.

If your fastening schedule is subject to inspection, it's a good idea to let the inspector know beforehand that you'll be using adhesive so that he can schedule an inspection in progress. Otherwise, take photos to back up your assertions.

When using adhesive, I typically add a slight curve to the drywall panels before installation. This ensures a tight bond to the framing (Figure 4). To bend the panels, I stack them face up overnight, or until they take on a permanent 2-inch set, with the ends supported on 2x4s. Note that excessively humid conditions may soften the gypsum and prevent setting. When the slightly bowed panel is attached around its perimeter, the center is forced tight against the adhesive-coated framing, thus eliminating the need for temporary fasteners. No field attachment should be necessary on walls. Hand pressure at each framing location will ensure proper embedment in the adhesive.

For ceilings, I fasten the perimeter of the panel on 16-inch centers. I install one screw every 24 inches across the face when the long edge of the panel is parallel to the framing, or one screw per framing member in the center of the panel when the long edge is perpendicular to the framing. Don't apply more adhesive than can be covered within 15 minutes.

**Panel orientation.** When hanging walls, I prefer to hang the drywall horizontally, because it unites more studs at a time, adding bracing strength. Horizontal

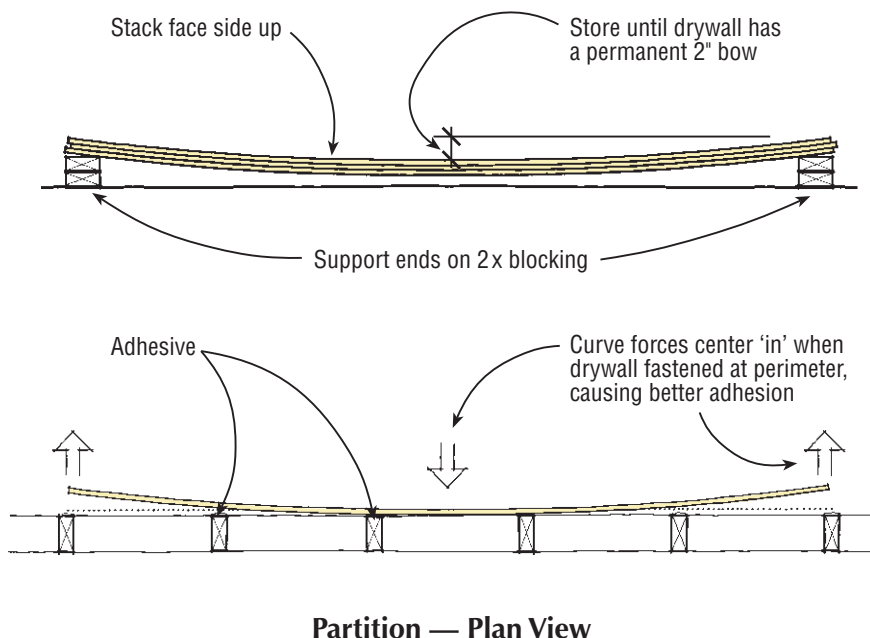
seams are also less obvious in strong light, and when a seam runs perpendicular to the framing, it flows over any misaligned or bowed studs and helps to hide these imperfections.

### Problems with Taped Seams

When taping drywall seams, the air, surface, and compound temperature should be at least 55°F, with 65°F to 70°F being ideal. It's a good idea to establish the ideal temperature at least a few days before the drywall hanging starts. Once the hanging and taping are underway, maintain a constant temperature — don't work in 80°F weather during the day, then let the temperature drop to 45°F at night. The drywall phase is an important part of the job, so don't try to save a few dollars on heat. In addition, provide adequate ventilation and airflow to help remove excess moisture.

Cold and damp weather will adversely affect the taping job, delaying drying times and possibly softening the panels, but hot and dry weather can cause problems, too. Heat can affect the joint tape bond. Hot, dry weather hastens drying, which can result in poor bonding of the tape, edge cracking, and excessive shrinkage of compound. So take some precautions in hot and dry conditions. Eliminate drafts, work shorter joint lengths, use faster setting compounds, and don't weaken the compound by adding excess water.

## Prepping Drywall for Adhesive



**Figure 4.** When gluing drywall, it's helpful to stack it overnight to create a slight bow (top). When attached at the perimeter, the curve forces the center of the panel tight against the framing, eliminating the need for temporary fasteners.

**Appropriate compounds.** Premixed all-purpose joint compound is very common and convenient to use for all three coats of the taping process, but it doesn't have the same strength, bonding qualities, or stability that a dedicated taping and topping compound combination has.

The first coat of the taping process is the tape-embedding coat. It's the most important coat because it is the one from which the joint derives its strength. When dry, the taped joint should be as strong as the drywall panel itself, or normal structural movement may cause joint cracking. I strongly recommend using a tape-embedding compound for the first coat. Look for compounds specifically made for this purpose — it should say so right on the product label. Other compounds are made for topping and finish coats. An all-purpose compound is acceptable for embedding use. I usually work with USG joint compounds; they're consistent, workable, and readily available.

**Paper tape** is stronger than fiberglass mesh tape. It resists stretching, wrinkling, and other distortions during normal structural movement. Fiberglass mesh tape is subject to stretching and is more likely to crack along seams during normal structural movement, so it should be embedded in a setting-type compound to give it added strength. Recently, improvements have been made to mesh tape, making it less likely to stretch and crack. However, it's still best to use a setting-type compound with any mesh tape for the embedding coat.

**Butted seams.** The long edges of a drywall panel are tapered to allow for some tape and compound buildup without creating a visible ridge, but the butted ends are square. To reduce the appearance of butt-ridging, keep butted seams to a minimum by using the longest panels available. Keep the butt joint stable by carefully centering it on the framing member, and use screws, rather than nails, to attach the panels. Sometimes I'll cut a V-groove along the butted seam to remove loose or torn paper facing and allow a deeper seam fill. Visible butt joints in ceilings can be particularly troublesome. I know it's not done in many parts of the country, but it's common in much of the East Coast area to install 1x3 furring, also known as strapping, on 16-inch centers, perpendicular to the ceiling joists before hanging the drywall.



**Figure 5.** Mud- or glue-on perforated vinyl corner beads that move with the drywall, not with the framing, eliminate bead pops and make ding repairs a snap.

The drywall sheets are normally hung with the long edge parallel to the joists and perpendicular to the furring. Furring improves the stability of the drywall panels by bridging irregularities and canceling out movement between joists, and it provides a wider surface to center panel butts on. A trick some builders use is to insert a ripping of  $\frac{5}{8}$  plywood to fur where the butt joints will fall. The plywood is about  $\frac{1}{8}$  inch thinner than the 1x3, enabling the drywall to be slightly recessed at the butt. During finishing, the joint can be taped and tooled flush with the surrounding surface, rather than creating a raised seam.

### Corner Bead

The corner bead callback can look like someone drew a line with a sharp pencil about an inch in from the corner along the length of the outside corner bead. Or it can look kind of wrinkled, with some compound missing here and there, or be a slightly protruding ridge along the entire corner. Whatever the problem, metal corner bead is a real nuisance to repair. Maybe it's time to use something besides the old standard nail- or crimp-on metal bead. I have had excellent results with the newer mud- or tape-on corner beads (Figure 5). Mud-on beads are usually made of plastic or metal that is covered with paper. Products include No-Coat (Drywall Systems; 888/662-6281; [www.no-coat.com](http://www.no-coat.com)), Sheetrock paper-faced

metal bead from USG (800/621-9622; [www.usg.com](http://www.usg.com)), and Strait Flex (Con-Form International; 888/747-0220; [www.straitflex.com](http://www.straitflex.com)), to name a few. They all share the common advantage of being held in place by embedment in joint compound, so there are no nail pops when the wood framing shrinks. Adhesion to the drywall with a continuous layer of joint compound makes a very stable corner that is resistant to edge cracking and the stresses of normal building movement. There are also vinyl corner beads that attach with spray-on contact cement, such as those from Trim-Tex (800-874-2333; [www.trim-tex.com](http://www.trim-tex.com)), Vinyl Corp. (305/477-6464; [www.unimast.com](http://www.unimast.com)), and Plastic Components (800/327-7077; [www.plastic-components.com](http://www.plastic-components.com)), that work very well. I like Trim-Tex because it comes in several lengths and widths, with plenty of angle and corner accessories. It goes on easily, and holds up well. Even if it gets hit, it's easy to repair, because the only damage is a little loose joint compound. However, if you insist on using metal corner beads, here are a few tips:

- For ceiling-to-floor corner beads, cut the bead approximately 1½ inches short and push it tight against the ceiling. This reduces the risk of the bead binding and coming loose if the wall settles slightly. Follow this rule for any type of corner bead.
- Attach corners by working from the top down, installing fasteners opposite one another every 8 to 10 inches.
- Avoid nailing into the top wall plates.
- Make sure that the edge of the corner bead lies flat and tight against the wall and that the outside bead is raised only slightly above the plane of the drywall.
- Strengthen the edges with paper tape and joint compound to create a tape-on bead effect.

## Expansion Joints


One detail that I don't see very often in residential work, at least in my part of the country, is the expansion joint, sometimes called a control or relief joint. An expansion joint is a metal or plastic strip that is attached between the abutting edges of two drywall panels (Figure 6). You can walk into almost any two-story home and find at least a slight ridging along a

horizontal seam on each side of the stairway. Often, there is excessive ridging that is impossible to conceal by feathering out with additional compound. An expansion joint solves this problem. The finished joint will be a maximum ½-inch-wide groove, running level around the stairway walls, located where the ceiling joist meets the first floor wall. If a metal or vinyl expansion strip is used, the joint can be painted to match the wall. If a trim board is used to conceal the joint, you can eliminate the strip and just leave a ¼-inch gap just above the top of the first-floor wall plate. Either approach is much more attractive than a ridged seam.



**Figure 6.** Expansion joints can prevent ridging at tall expanses of drywall, as in stairwells. The joint can be painted to blend in or be concealed by trim.

## Painting Tips

Do not allow painters to begin work before all taped joints are thoroughly dry; painting over wet joints is a major cause of joint discoloration. Differences in suction between the paper facing and the joint compound may cause the paint color to appear lighter or darker, making the joint conspicuous. A coat of primer is necessary to help equalize the porosity and texture of the taped drywall surface. I like to use USG's First Coat, a good-quality latex primer that's formulated with a high solids content, and apply it undiluted. However, even a good prime coat may not be enough when decorating with glossy paint. In this situation, I recommend applying a skim-coat of compound to the entire wall surface first to equalize the surface reaction. 

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