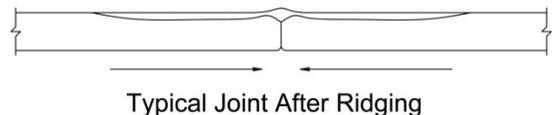
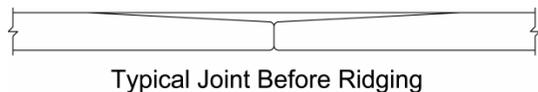


## GA-221-2019

### CAUSES, PREVENTION, AND REPAIR OF JOINT RIDGING AND CENTERLINE CRACKING

Joint ridging, also called beading, is a uniform, fine linear deformation occurring at the joint between two gypsum panels. Centerline cracking is cracking that forms at the centerline of the joint between two gypsum panels and can occur simultaneously with joint ridging.



## CAUSES

### Environmental Conditions

While there can be numerous causes for joint ridging and centerline cracking, environmental conditions are a frequent cause. Virtually all ridging and cracking occurs at panel joints.

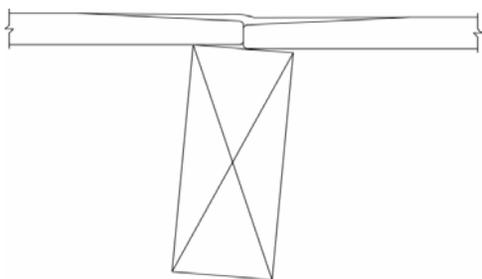
Ridging can result from the gypsum panel joint being forced together due to wood framing members shrinking. Centerline cracking can result from stress being exerted on the gypsum panel joints due to wood framing members swelling or shrinking from exposure to periods of high or low temperature and humidity fluctuations.

Changes in the building temperature and humidity during construction through occupancy can lead to component movement. This results in a crack or a ridge forming at the joint of the gypsum panels. Maintaining stable indoor conditions in the building during and after construction will minimize joint ridging and centerline cracking.

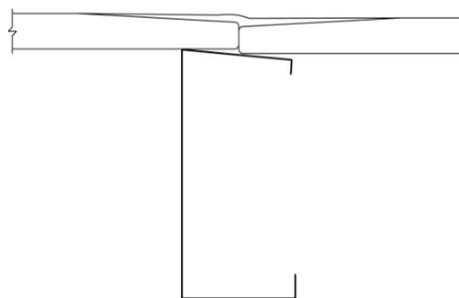
### Workmanship

Joint ridging and centerline cracking can also be caused by improper installation and finishing, including:

- Improper application of gypsum panels is another cause of joint ridging and centerline cracking. In many but not all cases, the ridges and cracks from improper installation are visible soon after the joints have dried or cured.
- Fastening gypsum panel products to warped or misaligned studs is a significant cause of ridging and cracking.
- Improper fastening of gypsum panel products to steel studs can bend a stud and cause a ridge.
- Improper preparation and finishing of butt joints can cause ridges or cracks.
- Panels installed at doorframes and windows with joints located closer than 12 in. (300 mm) to the corner are prone to cracking.
- The practice of “belly banding” is another cause of ridging and cracking.



**Typical Ridge From  
Warped/Misaligned Framing**



**Typical Ridge From Bent Framing**

## **PREVENTION**

### **Environmental**

Heavy loads need to be in place prior to initiating the finishing of joints to minimize the potential for ridging and cracking:

- Roofing materials should be evenly distributed on the roof framing.
- Large plumbing items such as bathtubs should be in place.
- Heavy mechanical assemblies such as heating equipment and air conditioners should also be installed.

Room temperature shall be maintained at not less than 40°F (4°C) when mechanically attaching gypsum panel products. Room temperature shall be maintained at not less than 50°F (10°C) for adhesive application of gypsum panel products and during the application of joint treatment, texturing, and decoration. When a temporary heat source is used, the temperature shall not exceed 95°F (35°C) in any given room or area. Provide adequate and continuous ventilation in the work area to control humidity during installation and drying or curing of joint compounds.

When taping and finishing of gypsum panel products is completed, room temperature shall be maintained above 50°F (10°C) and below 95°F (35°C) to minimize movement of building materials.

### **Workmanship**

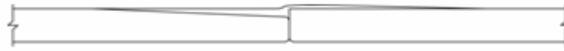
Inspect framing for warped or twisted studs, proper alignment, and proper spacing to identify areas with the potential for ridging or cracking. Proper procedures and workmanship during installation of framing and during installation of gypsum panels will minimize issues due to misaligned framing.

The use of resilient channels in ceiling construction allows the underlying joists and trusses to move without transferring compression and expansion forces directly to gypsum panel products.

Joints between the tapered edges of adjacent gypsum panels will typically be more crack-resistant than end (butt) joints. Gypsum panel edges are tapered and designed to be filled with joint compound and tape, while cut ends (whether field-cut or factory-cut) are essentially square ends. End joints can be strengthened and the potential for cracking can be minimized by beveling adjoining panel ends before installation. Bevel panel ends

## CAUSES, PREVENTION, AND REPAIR OF JOINT RIDGING AND CENTERLINE CRACKING

approximately 1/8 in. (3 mm) at a 45° angle using a sharp utility knife and remove any loose paper prior to installation. Gypsum panel ends should be in moderate contact. Prefill any gap with joint compound and allow to dry or prefill with setting compound and allow to set. Apply compound and joint tape in the same manner as for tapered joints.



**Tapered-Edge to Flat-Edge Joint Showing Ridging**

### “Belly Banding”

The widespread use of “belly bands,” also referred to as “rips,” should be avoided. Belly bands are typically used in walls over 8 feet (2440 mm) in height where two courses of gypsum panels are applied horizontally at right angles to the studs. For more information on belly bands, refer to GA-255 *Guidance on the Use of Panel Rips*.

### REPAIRS

In order to allow a wall or ceiling system to stabilize, it is recommended that repairs not begin until the building has gone through at least one complete heating/cooling cycle, typically one year. Repairs should only be undertaken in a warm, dry environment. Repairs to drywall tape and joint compound are subject to re-cracking or re-ridging if:

- The building is not properly conditioned during the repair period,
- The building is left unconditioned for extended periods of time, or
- The underlying source of movement is not properly mitigated.

If a structure has been properly conditioned and ridges or cracks appear again after repairs, please consult with industry professionals in your area to discuss alternate repairs beyond drywall finishing products, which are cosmetic in nature.

#### Repair of Ridging

*If a ridge is due to continuing expansion and contraction or structural movement of the building, a control joint or alternate repair may be required.* Lightly sand the ridge down, taking care not to damage the embedded joint-reinforcing tape. Apply joint compound to the area being treated, feathering as wide as necessary to create an essentially flat surface. *If the joint tape is damaged, the damaged tape and joint compound must be removed and the joint re-taped and finished, feathering as wide as necessary to create an essentially flat surface (see Finishing).*

#### Repair of Cracking

*If a crack is due to continuing expansion and contraction or structural movement of the building, a control joint or alternate repair may be required.* Widen the crack and remove any loose tape and chipped compound. Sand the area to remove any residual loose materials. Prefill the crack with joint compound and allow to dry or prefill with setting compound and allow to set. Apply compound and joint tape, feathering as wide as necessary to create an essentially flat surface (see Finishing).

**Finishing**

After the joint compound is dry, sand lightly and feather the edges, removing any tool marks. Examine the sanded area to determine if the ridge or crack has been eliminated. If examination indicates it has not been adequately concealed, additional application and feathering of joint compound may be required. Allow drying-type joint compound to dry completely before proceeding. Setting-type joint compound must be set before applying the next coat of joint compound and must be dry before painting. Refer to manufacturer's specifications for setting times of various setting-type joint compounds.

The repaired joint should be painted with drywall primer and allowed to dry thoroughly prior to application of final decoration.

**NOTES:**

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