Gypsum Joint Ridging and Cracking Prevention

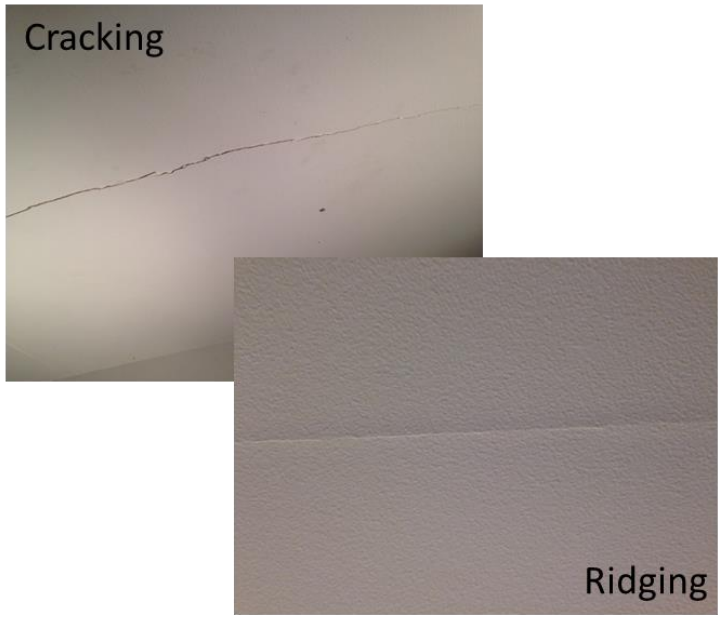
Installation Guide
Revised 7/14/2017

SBCA™

SBCA has been the voice of the structural building components industry since 1983, providing educational programs and technical information, disseminating industry news, and facilitating networking opportunities for manufacturers of roof trusses, wall panels and floor trusses. **SBCA** endeavors to expand component manufacturers' market share and enhance the professionalism of the component manufacturing industry.

Introduction

- Cracking can occur in the center of taped drywall joints
- Ridging occurs when a small hump (~3/8” wide) appears along the taped joint of ceilings.
- Both are common problems that typically occur along large open spans.
- This presentation describes steps to reduce the problems with gypsum ridging and cracking (GRC).



Step 1: Compare Truss vs Building Design Deflection

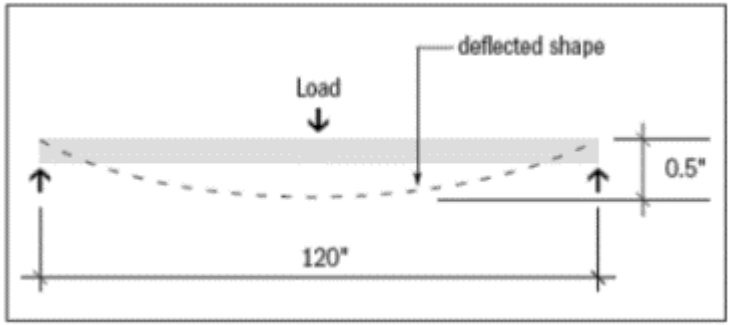
- Verify that the truss design deflection and the building designer's deflection specification (if any) are compatible or within +/- 10% of one another.

DEFL.	in	(loc)	l/defl	L/d
Vert(LL)	-0.33	21-22	>999	240
Vert(TL)	-0.56	21-22	>719	180
Horz(TL)	0.05	16	n/a	n/a
Attic	-0.24	21-22	781	360

DEFL.	in	(loc)	l/defl	L/d
Vert(LL)	-0.29	19-20	>838	360
Vert(CT)	-0.39	19-20	>620	240
Horz(CT)	0.06	18	n/a	n/a

Step 2: Verify Truss Design Deflection vs USG

- Verify that the truss design deflection meets the USG specification as stated in The Gypsum Construction Handbook, Chapter 2-Framing:
  - For drywall assemblies it is desirable to limit deflection to L/240 (L = length of the span in inches) and to never exceed L/120 (L/180 in some codes).
  - The preferred limit for veneer assemblies is L/360 and should not exceed L/240.



$$D = \text{Deflection Limit} = \frac{L}{240}$$

Where

$L = 10'$ or $120''$

$$D = \frac{120}{240}$$

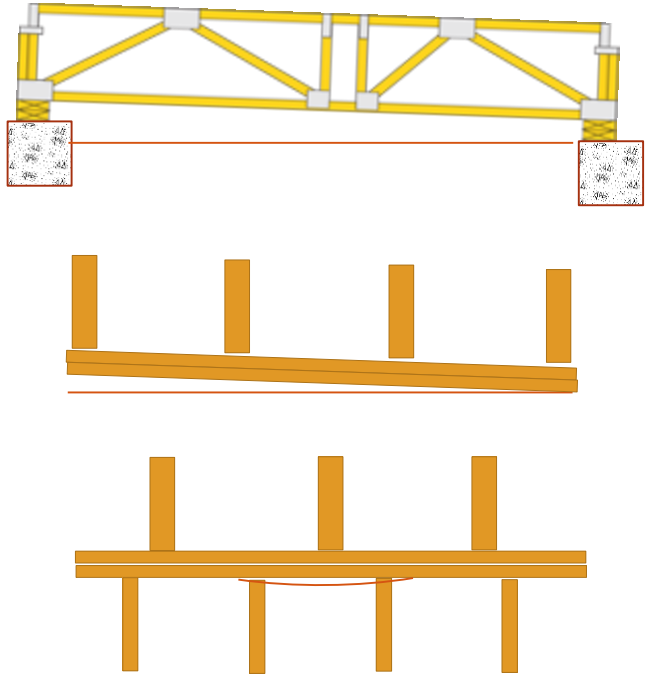
$$D = 0.5''$$

Step 3: Verify Trusses are Level

- Verify that the trusses are level and the ceiling plane is flat by measuring at various locations using a laser level.
  - Gypsum installation should occur only after the framing techniques are of sufficient quality to avoid unacceptable movement in the framing members.

Step 3: Verify Trusses are Level

- Out of level movement can be due to:
  - Concrete slabs not being level.
  - Bearing walls top plates being at differing heights along the bearing length.
  - Trusses sitting between studs causing local deformation.

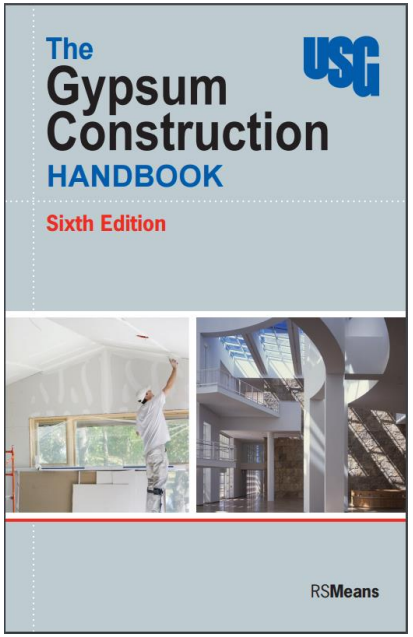


Step 3: Verify Trusses are Level

- If the trusses are not level, it strongly recommended to **NOT** attempt to stiffen and/or alter trusses without the approval of the building designer and modification details provided by the building designer, truss designer or truss manufacturer.
  - Improper modification of the trusses can alter the truss system behavior and in most cases will not solve the problem.

Step 4: Documentation

- The USG Gypsum Construction Handbook recommends that the drywall contractor document the following items, to assist in troubleshooting if a problem does occur:
  - Date, time, temperature and humidity at the time of drywall application.
  - Method and how long the structure was conditioned prior to installation.
  - If ventilated, the method of ventilation.
  - Type of joint compounds used.
  - Type of finish specified and what was implemented.



Step 5: Conditioning of Materials

- Allow materials to condition at the site prior to installation.
- Allow materials to condition for 48 hours prior to the joint taping process.

Step 6: Use Resilient Channels

- Ceiling construction utilizing resilient channels between the drywall and the framing produced the most consistent reduction in the incidence of GRC even when past repairs failed.

Step 7: Proper Framing Techniques

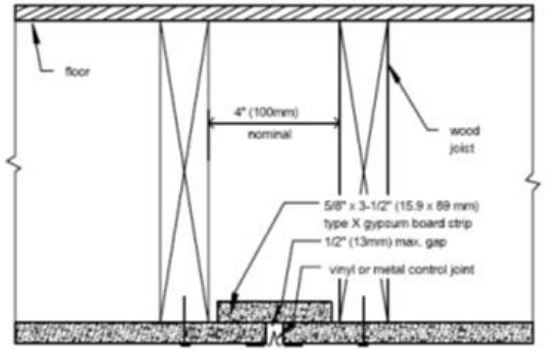
- Back-block gypsum board joints.
  - This is an additional cost, but it is cheaper than call backs and dissatisfied customers.

Step 7: Proper Framing Techniques

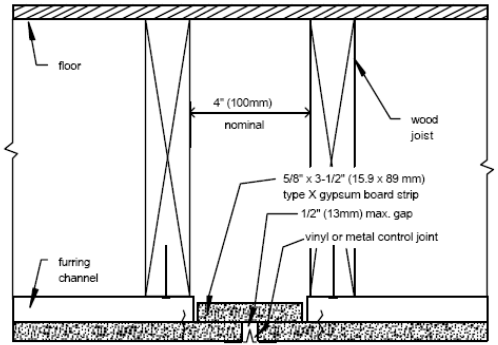
- Prior to installation, inspect the framing to eliminate gaps between framing members that will affect the wall board installation process.
- Avoid use of wet lumber.

Step 8: Control Joints

- Use control joints in long walls and ceilings.
- Control joints in interior ceilings without perimeter relief must be installed so that linear dimensions do not exceed 30 ft. and total area between control joints does not exceed 900 sq. ft.



CONTROL JOINT PARALLEL TO FRAMING WITH DIRECT-ATTACHED CEILING
(UL R4024, 97NK13566, 7-29-96)



CONTROL JOINT PARALLEL TO FRAMING WITH FURRED CEILING
(UL R4024, 97NK2136, 2-7-97)