

Ceiling/Floor Partition Separation Update



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The winter season of '92-'93 produced an apparent surge in the incidence of ceiling/floor partition separation problems. The theories to explain this increase range from the weather (a mild but wet winter), to lumber drying practices (a shift from KD-15 to KD-19 production), and to a changing lumber resource (more juvenile growth wood). Whether or not any of these theories have any truth to them is anyone's guess.

One thing that is bound to drive up reports of problems is awareness. The phenomenon known as CFPS or Ceiling/Floor Partition Separation has probably been around since the time that using large amounts of insulation in attics became common. Articles on the problem started showing up in the 1970's and many more were written in the 1980's. Today, many builders are not only aware of the problem, if it occurs in their area, but they also know a little about how and why it happens. Just note how quickly and reliably a case of CFPS is blamed on the trusses. But many cases are not caused by truss arching at all, or else truss movement is only one part of the problem.

This leaves the wood truss industry in the position of solving someone else's problem. Even if trusses are the main problem in a case of CFPS, most of the repair options are things that could have been done by the builder in the first place to avoid the problems. Since the occurrence of CFPS cannot be controlled by the design and manufacture of wood trusses, what should the truss industry's response be when someone claims that trusses are arching up? This

article will look at what truss suppliers, builders and designers can say and do when drywall joints crack and gaps open up.

WHAT CAN BE SAID

1. Natural Shrinking And Swelling Of Wood

Separations between interior partition walls and the ceiling or floor can occur for a variety of reasons. One of the causes is known as truss arching or truss uplift. It is the natural shrinking and swelling of the wood that results in this movement. The movement can repeatedly cycle up and down in response to seasonal changes in the wood's moisture content.

2. Not A Structural Problem

Truss uplift movement does not indicate a structural problem or a lack of strength in the wood truss. Building owners can be assured that the structure will not fail. There is nothing that the truss manufacturer or truss designer can do to a truss to prevent CFPS.

3. Do Not Fix The Truss

There is nothing that can be done to the truss to permanently and reliably eliminate the movement without reducing the structural integrity of the truss. Cutting truss members to force a truss to move down will weaken the roof or floor structure. It can also redistribute the reaction forces to walls that are not bearing walls and cause other problems.

4. Float the Drywall Joints

The real problem is that the drywall attachment and the connection between trusses and partition walls are not constructed to allow for expansion and contraction of the structure. Proper detailing of these connections (see "Peaks" Vol. 13, No. 1), so that the drywall joints will "float," is the best way to avoid the problem and also to fix the problem once it has happened. In other words, the fix is to do what could have been done in the first place to avoid the problem.

WHAT CAN BE DONE

1. Truss Suppliers

As a truss supplier, you can document that you have performed your duty to in-

form the users of your product about potential problems. An information sheet can be included with the delivery of trusses and you can require the builder to sign a receipt acknowledgement. A sample of such an information sheet is shown on the following (facing) page of this issue of "Peaks." You may wish to state that you will not be responsible for any drywall or other finish problems if floated drywall corner construction is not used.

2. Building Designers

As a building designer, you can specify floated drywall corner joints and appropriate connections between trusses and partition walls. There are a number of framing hardware products available that make these details and connections simple to do.

3. Builders

As a builder, use framing practices that are compatible with trusses (see "Peaks" Vol. 13, No. 1). Generally, this means making only a light connection between trusses and non-load bearing partition walls. You can also provide ceiling drywall nailers that permit the ceiling boards to be floated at the partitions. And, of course, insist that the drywall contractor use floated corner construction.

The summer season is not the time of year when the truss uplift phenomenon is given much attention since seasonally occurring gaps tend to close up during warm weather. But next winter's problems are being built now. One of the difficulties is that most builders rarely experience a case of CFPS. It is hard for them to justify the cost of preventive measures. Fixing an occasional problem is cheaper than reducing the possibility of an occasional problem. This is a risk that the builder may prefer to take. From the truss supplier's point of view this is all right as long as the builder will take responsibility for the consequences.▲

The following page is a reprint of a Technical Update published and supplied by Alpine and Lumbermate on Ceiling/Floor Partition Separation.

Important Information For Contractors & Builders about Ceiling/Floor Partition Separation!

Ceiling/partition separation has occurred occasionally in wood framed buildings causing gaps in the drywall along the corners between the ceiling and the partition walls. Ceiling/partition separation is caused by a combination of material characteristics and environmental conditions, and can be prevented by using correct and well-established construction practices.

Causes For Ceiling/Partition Separation

1. Bearing and support settlement.
2. Shrinkage of framing lumber, joists, and headers due to drying of lumber.
3. Raising of the roof trusses.
4. Excessive deflection of floor below the partition.

Bearing and support settlement and shrinkage of framing lumber can cause gaps that will not reoccur after the structure has settled and reached an equilibrium level.

Excessive deflection of the floor below the partition can be caused by inadequate distribution of the partition load to the supporting structural members or inadequate load carrying capacity. Gaps due to this condition will initially increase, but level out after the initial deflection and creep in the structural material has taken place.

Rising of the roof trusses can cause seasonal appearance of gaps. They open up in winter and close again in summer. The up and down movement of the truss is caused by differential shrinkage and expansion of the chord members of the roof trusses. This is caused by changes in the moisture content of the wood.

Encasement of bottom chords in thick layers of insulation, improper ventilation and a larger percentage of juvenile wood in the construction lumber are factors that contribute to the movement of the trusses. The truss configuration, production techniques, or other variables within the control of truss designers or truss manufacturers are not the cause for this phenomenon.

Recommendations To Avoid Ceiling/Partition Separation

1. Make sure that foundations are of the right size and properly placed and on suitable bearing material. Request an inspection by a professional engineer if in doubt.
2. Provide adequate structural supports under all partitions.
3. Use dry lumber for headers and load bearing structural framing. Prevent exposure of these structural components to rain for long periods.
4. Protect trusses from exposure to rain during extended periods of storage.
5. Do not ventilate kitchen and utility vents into the attic space.
6. Provide adequate ventilation from the attic space to the outside.
7. Insist that the drywall contractor uses a floating corner construction. The ceiling drywall must be secured to the wall with a metal clip or some other suitable means to prevent it from rising up with the trusses (see recommended application and finishing of gypsum board.)

Studies of ceiling/partition separation problems have shown that one or several of the above shown items have been ignored. Following the above recommendations will not guarantee that there will never be a problem, but they will help to eliminate the effects of the presently known causes for ceiling/partition separation. Useful publications for proper installation of trusses and correct ventilation are "Handling, Installation, and Bracing Metal Plate Connected Wood Trusses HIB-91" from the Truss

Plate Institute and "Principles of Attic Ventilation" by Air Vent, Inc.

Recommended Application And Finishing Of Gypsum Board

Lumbermate's recommendation on how to attach gypsum board to wood trusses to avoid cracks or open joints at wall/ceiling lines. Please read carefully!

Floating Interior Angles

To minimize the possibility of fastener popping in areas adjacent to the wall and ceiling intersection, the floating angle method of application may be used for either single or double layer application of gypsum board to wood framing. This method is applicable where single nailing, double nailing or screw attachment is used. Gypsum board should be applied to ceilings first. (See Figures) Floating interior angles should be used where fire ratings are required.

The first attachment into each ceiling framing member framed perpendicular to the intersection should be located 12 inches out from the wall intersection for 1/2" board and 16 inches for 5/8" board.

Gypsum board on sidewalls should be applied so as to provide a firm support for the floated edges of the ceiling gypsum board. The top attachment into each stud should be located 8 inches down from the ceiling intersection for single nailing and 11 to 12 inches for double nailing or screw application. (See Figures) Also, see Gypsum Association GA 216-85. ▲

