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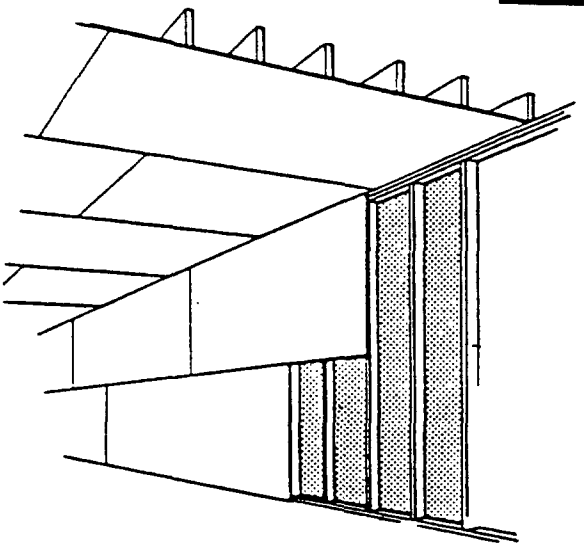

GYPSUM WALLBOARD APPLICATION METHODS

→ designed to minimize ridging

FLOATING END JOINTS

TAPERING END JOINTS

BACK BLOCKING

prepared by

UNITED STATES GYPSUM COMPANY

the greatest name in building

300 West Adams Street Chicago 6, Illinois

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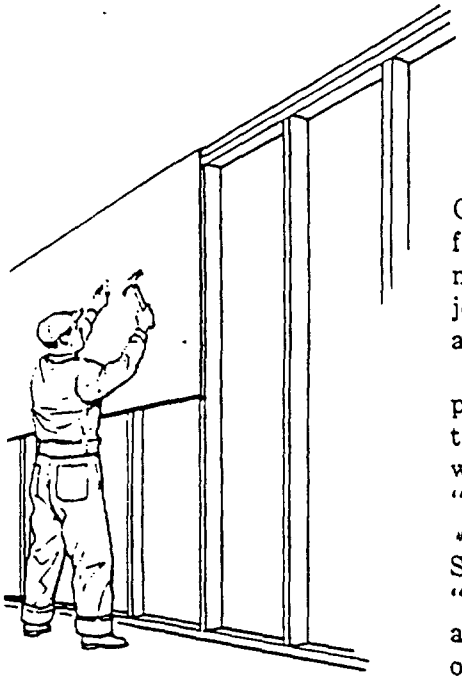

INTRODUCTION.....

Gypsum Wallboard drywall construction has made rapid progress in the last few years. Gypsum Wallboard is fast becoming the standard wall and ceiling material for residential construction. The proficiency of the mechanics doing joint finishing work has been highly instrumental in the growth and public acceptance.

The skill with which joints are now being concealed highlights certain basic problems which several years ago were not noticed or recognized. We refer to the difficulty of properly concealing end and edge joints under all practical working conditions. We refer specifically to a deformity called "ridging" or "beading."

The construction procedure herein described was developed by the United States Gypsum Company and practicing applicators as a means of minimizing "ridging" deformities. The procedure is simple and effective. It has been tried and proven. One contractor reports using this system on 16 million square feet of wall and ceiling area over the past few years without a serious complaint.

The following has been prepared in order to give you general information on the subject of ridging and the steps which may be taken to minimize it.

RIDGING DEFINED

"Ridging" or "beading" is a joint deformity which appears, as the name implies, as a continuous ridge or bead along the length of the joints. It is often confused with other types of deformities, principally a starved joint, or joints, which occur on twisted studs. In general, ridging can be diagnosed reasonably accurately by its uniform fine ridge-like pattern along the exact center of the joint.

CHARACTERISTICS

Unlike other defects which are apparent almost immediately, ridging generally develops and becomes apparent after the joint finishing work has been completed. This period of time may be from a few hours up to several months before it first becomes apparent depending upon factors described later on.

Many applicators and contractors are of the opinion that ridging is a relatively new problem—that years ago they were never bothered by such a condition. Actually, we first observed ridging in 1940. We know that this condition has always existed and we have observed that ridging does not become a serious problem until a certain skill in joint finishing is attained. Ridging in the past was generally not specifically noticed because of the many other imperfections due to relatively poor workmanship. Today, with large numbers of applicators doing extremely high quality work and with a more critical market, ridging has become a problem requiring recognition.

It is often felt that ridging occurs only on ceilings. Actually, it occurs on side walls with the same frequency as on ceilings. However, it is much more apparent on ceilings than side walls because the ceiling is the largest unbroken surface in the room and the angle of view and light conditions are more favorable for the detection of blemishes.

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CONDITIONS CAUSING RIDGING

We know, not only by observation but also by laboratory tests, that not all jobs ridge to the same degree. The degree to which they will ridge depends upon a combination of factors. We know definitely that the possibility of ridging is greater on jobs when the joints are taped and finished during cold, damp or high humidity periods. We also know that in the case of two joints—one finished with a high crown or heavy fill and 14" wide, and one finished flat and 8" wide—that under the same climatic conditions during taping and drying the flat and narrow type of joint concealment will ridge to a lesser degree. Joints finished with a high crown during damp, cold climatic conditions or under conditions of high humidity are almost certain to ridge to an objectionable degree, whereas joints finished flat and narrow under ideal drying conditions seldom ridge to a degree where it is visible to the eye under normal lighting conditions. These two combinations represent the extremes of causes and results. There are many in-between combinations which may cause objectional ridging.

The explanation as to exactly what causes the ridges to develop is complicated and difficult to explain without a lengthy dissertation on the subject. Since we feel that this information has little practical value, it is not covered.

Prior to World War II, construction activity was generally stopped during the winter months or periods of inclement weather. However, since that time, and due to an unprecedented demand for homes, residential construction is carried on during all months of the year. To maintain the year-around building program, builders have found ways and means of protecting various other components of the building from the hazards of extreme climatic conditions. These measures are costly but are the penalty for building during adverse weather conditions. The costs are reflected in the price of the house and the buying public has accepted the penalty.

Building under adverse conditions and at an increased tempo has had its effect upon the overall quality of joint finishing, and particularly with respect to the more frequent occurrence of ridging. This fact, combined with the increased proficiency of the joint finisher and a more critical market, dictates that steps must be taken to minimize the danger of ridging in gypsum wallboard jobs.

CONCLUDING

The United States Gypsum Company back blocking system was developed to minimize ridging. Its continuous use over a period of four years by many contractors is conclusive proof of its effectiveness, and likewise it is also proof that the cost is not prohibitive. We urge all applicators and contractors to adopt this system as a standard for all single layer wallboard construction.

The following is a pictorial presentation of the procedure for floating, back blocking and tapering end joints and back blocking edge joints.

RECOMMENDATIONS

We recommend back blocking all ceiling joints along tapered edges and floating and back blocking all end joints, side walls, and ceilings. End joints, side walls and ceilings may be tapered as shown at the discretion of the contractor or applicator. Generally, only the tapered edge joints in the ceiling are back blocked for it is seldom that side wall horizontal joints are visible.

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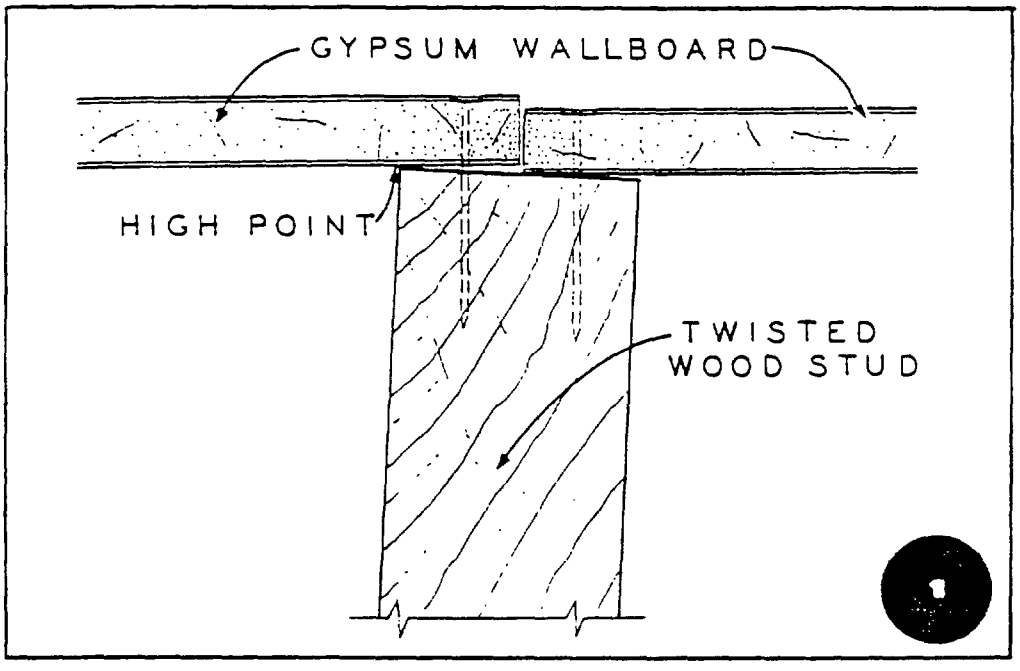
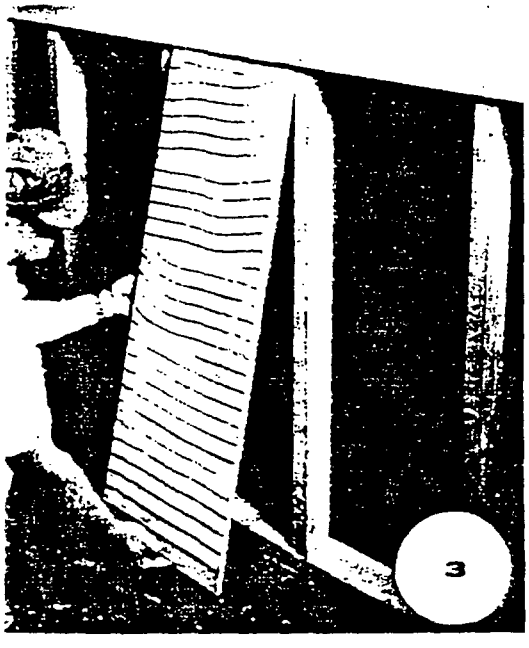
FLOATING and BACK BLOCKING END JOINTS... SIDE WALLS...



1 · Twisted Studs or Joists —The drawing on the left illustrates the difficulty of concealing end joints which fall on a twisted stud or joist. Note offset edges of adjacent boards. This joint cannot be concealed without excessive crowning, an act which stimulates ridging. Positioning joints or as hereinafter called "floating" joints between supports overcomes this problem.





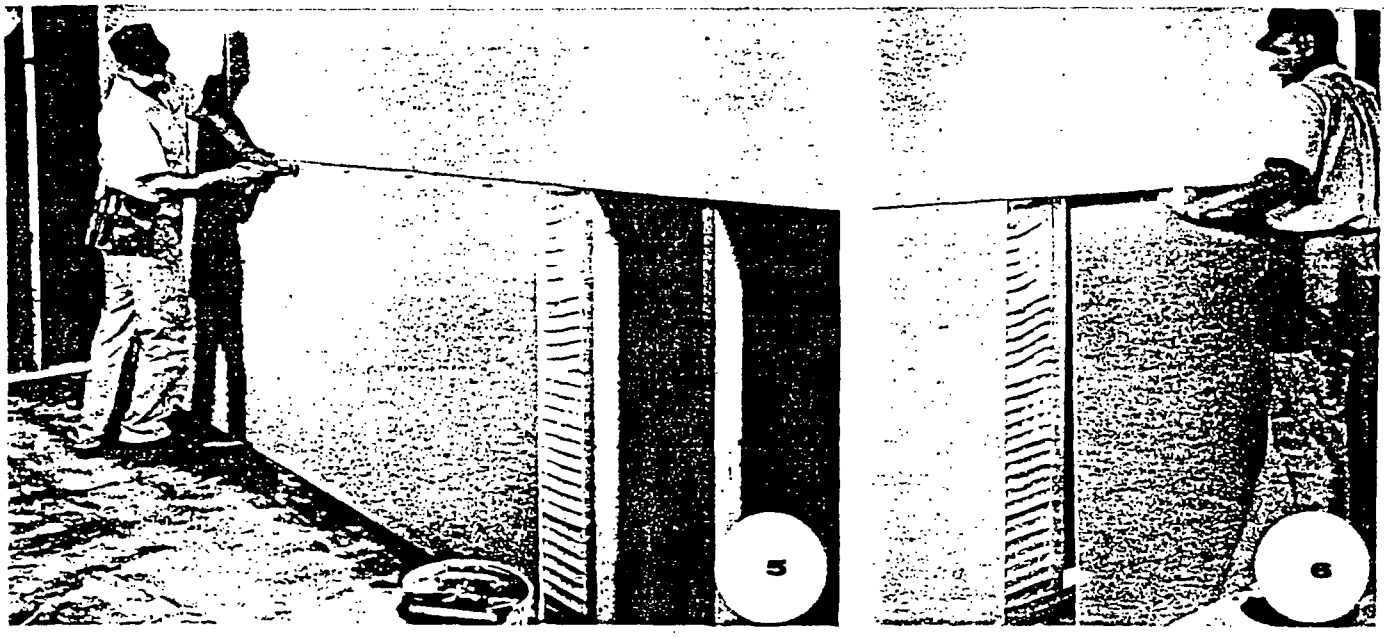


2 · Stopping Strips for Back Blocking—Strips of gypsum wallboard approximately 2" wide and 52" long are tacked in place along the side of the stud with a minimum of three nails and set back from the surface of the stud the thickness of the back blocking which is to be used. The purpose of the stopping strip is to hold the back blocking in position until the adhesive has bonded the blocking and surface boards together.

3 · Side Wall Blocks—The side wall back blocking is cut slightly less than the width of the stud space and approximately 4" longer than the space to be blocked, allowing the block to extend behind the upper course of board as shown. Note the high ridges of PERF-A-TAPE* cement (embedding type) applied so as to be at right angles to the vertical end joint. Ceiling end joints are blocked in a slightly different manner as shown in Fig. 12.

4 · Positioning Side Wall Blocks—The block is in position and is being nailed to the stud from the face as shown above. Two nails along each edge are sufficient. The block is held in the plane of the wall as formed by the studs by the scabs along the sides of the studs as shown in Figure No. 2. Always make certain that the blocking is flush or slightly back of the nailing face of the studs—never allow it to protrude.

*[illegible]



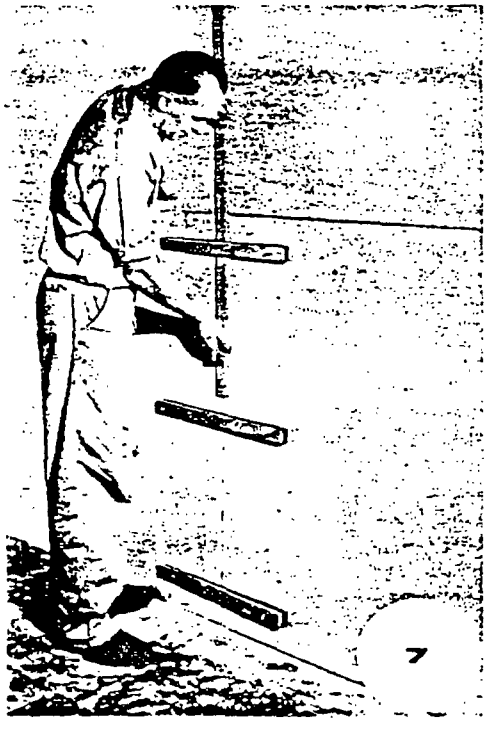
5 • Applying Gypsum Wallboard—The next step is to position and nail one wallboard panel in place. Note the end of this board occurs approximately mid-way between the supports and over the blocking. Also note that the end joints between the upper and lower courses of panels are staggered. As the gypsum wallboard is nailed along the stud, the end of the board is forced into the cement on the blocking.

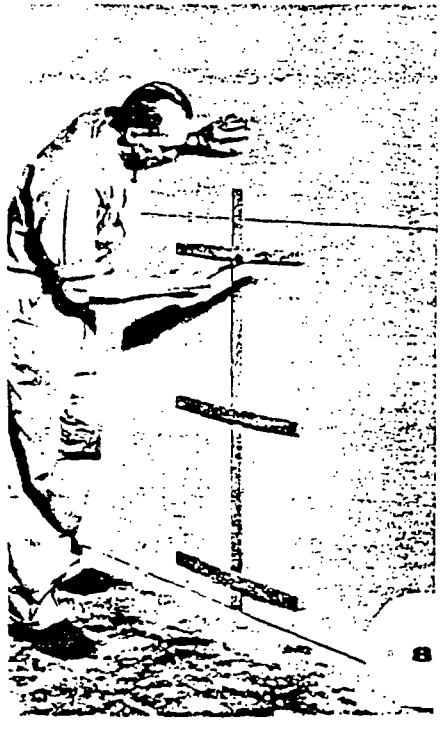
6 • Applying Gypsum Wallboard Continued—The adjacent panel is put into place, loosely butted to the preceding one and nailed to the studs bringing the face board into contact with the cement. To assure alignment of the adjoining edges of the wallboard, 6" wide strips of wallboard are used in lieu of the oak flooring strips shown in Figure 8. After 24 hours the strips are removed and the joint is back blocked ready for taping. Joints treated in this manner will require the usual finishing technique of crowning necessary for end joints.

TAPERING END JOINTS...SIDE WALLS .....

7 • Tapering End Joints— In lieu of using scraps of wallboard to maintain alignment as described in Figure 6, the end joints may be tapered by following the procedure pictured on the right. The strips are pieces of ⅜" x 1½" oak flooring. The horizontal strips are first loosely nailed, with double headed nails, to the underlying supports. The vertical piece, which is approximately 54" long, is then centered over the joint and underneath the horizontal strips as shown. Ceiling joints are tapered in the same manner.

8 • Tapering End Joints Continued— After the vertical strip is in position and centered over the joint the double headed nails are driven in tight causing an inward pressure on the vertical strip. This pressure aligns and depresses the adjoining ends of the board. After 24 hours when the strips are removed, the end joints will spring outward but a slight concave depression will remain. The depression is usually sufficient to permit concealing and finishing the joint flat without the usual crowning.





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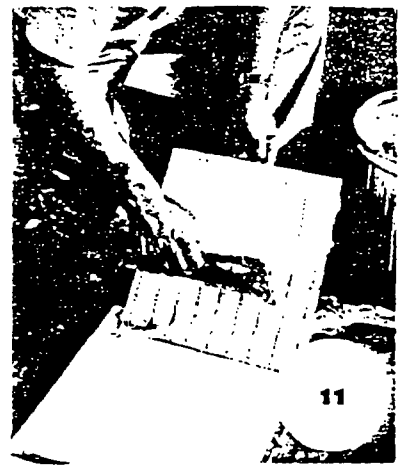
BACK BLOCKING CEILING JOINTS



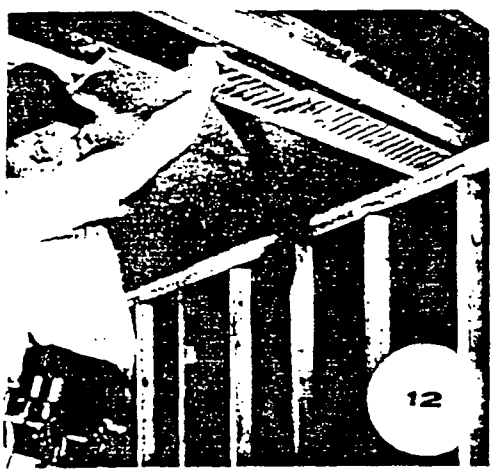


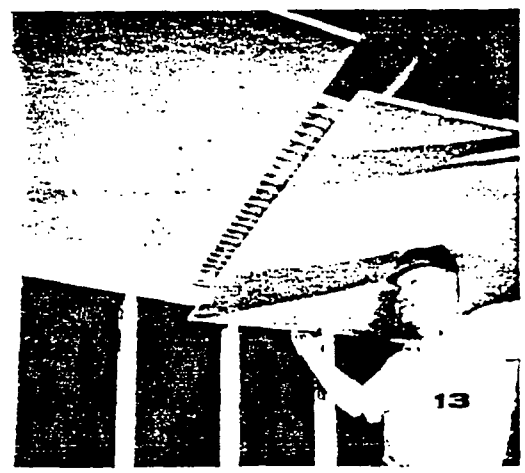


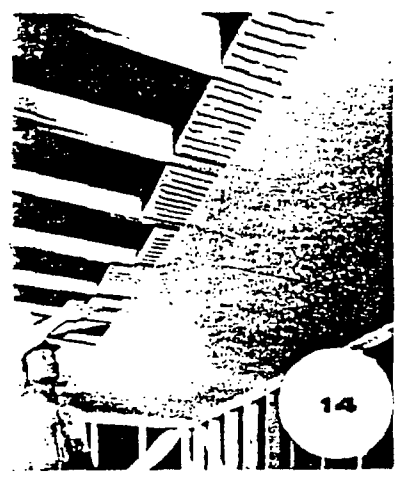
9 · Tools and Materials Needed—Backing blocks are cut from scrap wallboard. They should be approximately 10" wide and of sufficient length to fit loosely between the joist spaces. They need not be accurately cut. The adhesive is PERF-A-TAPE (embedding) cement mixed to a consistency which permits easy spreading and leaves a standing ribbon of cement. The spreader as shown can be made locally. The notches should be ¼" wide by ⅜" deep and spaced approximately 1½" o.c.

10 · Applying Ceiling—When the back blocking is used the gypsum wallboard must be applied with the long edges at right angles to the joints as shown in the picture. This procedure facilitates the placement of the blocks along the full length of the edge and ends of the board. The board in the above and following sequence of pictures will be applied in a manner illustrating floating end joints.

11 · Spreading Adhesive—The adhesive is spread on the blocks as shown. The adhesive is applied so that the ridges will be perpendicular to the joint. It is important that the ridges are well formed and are a minimum of ¼" high before installation. The cement should be spread on the blocks just before the blocks are to be installed. Vibration due to nailing of face boards will cause blocks to settle and the adhesive to spread.



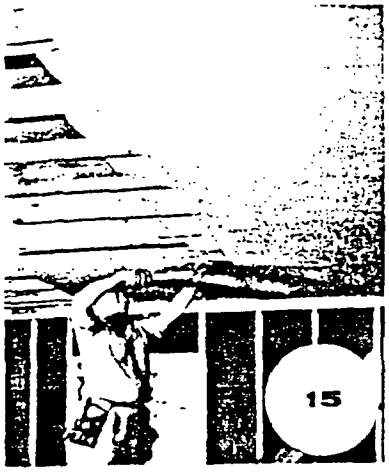


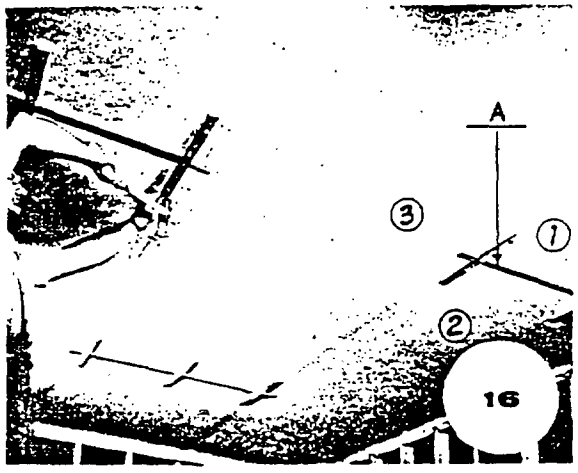


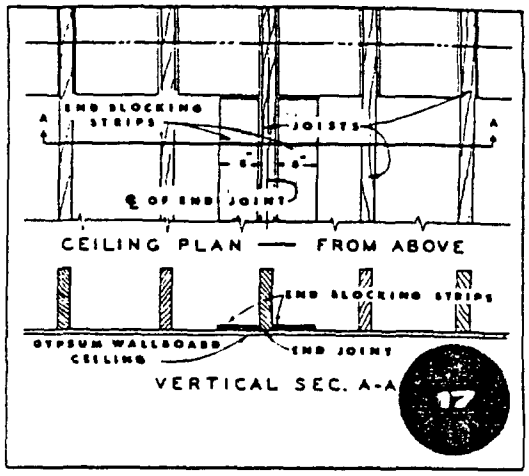
12 · Positioning Blocks for Floating End Joints—Note a different procedure is used in blocking ceiling end joints. Blocks are placed prior to erection of succeeding board. The same size blocks, which are used for the edges, are used for the ends, thus eliminating the need for different sized blocks. Blocks and cement are generally cut and mixed respectively in advance of the erection of the board. The general procedure on the job is for one man to complete nailing the board while the other applies cement to the blocks and places them.

13 · Continuing Board Erection—Immediately after all the blocks are in place the next board, which has been previously cut, is erected. To prevent the cement from drying and a resultant loss of bond always apply cement blocks just prior to erection of the wallboard. The ends are loosely butted. Care should be exercised to avoid tight fitting ends. On the other hand they should not be spaced apart. The ends of the boards should be free to move independently of one another.

14 · Positioning Blocks for Edge Joints—After the next board has been cut to the proper size, the blocks along the tapered edge are positioned. Slightly over half of the width of the block is resting on the ceiling board. Note that in all cases the cement ridges are perpendicular to the joint. The partner of the mechanic placing the blocks has finished nailing and is getting the next two gypsum wallboards cut to size.







15 · Continuing Board Erection—The mechanic is finishing nailing the first board of the second course in place. His partner is spreading cement on the blocks for the end joint. The next board which has been cut to size, will be positioned and nailed as soon as the end joint is blocked. Mechanics should always apply all face boards required to conceal blocks in position before going to lunch or taking normal job breaks. Nails, nail spacings and nailing practices are the same as for the conventional single layer gypsum wallboard construction.

16 · Tapering Ceiling End Joints—End joint "A" should be tapered as soon as board 1, 2 and 3 are in position. It is necessary to have board 3 in position before tapering since the wood strip over the end joint extends beyond the joint and on to the surface of board 3. The procedure for tapering end joints is the same as shown in steps 7 and 8. *Do not* depress ends of board more than ⅛". In lieu of wood tapering strips, supporting strips of wallboard may be used as described in Step 6 merely to assure alignment of adjoining ends.

17 · Back Blocking End Joints Which are Centered on Joists—As shown above, end joints may be successfully backed blocked without floating the joint between the joists. In this method the ends of the board are nailed to the joist in the conventional manner. Then the back blocking strip, with adhesive applied, is placed on top of the ceiling board as shown in the above sketch. This system is effective in minimizing ridging. However, it does not have the advantage of compensating for twisted joists as does the floating method.

SPECIFICATION

REMINDER NOTES TO ARCHITECT

1. Back blocking is used in single layer gypsum wallboard construction only.
2. See Sections 1 A, B and C, and 3. Delete Sections A, B or C, depending upon requirements of your job. (Floating and tapering end joints require back blocking. However, end joints may be back blocked without tapering or floating.)

FLOATING, TAPERING and BACK BLOCKING JOINTS

1. General Notes

- **A.** All ceiling end joints shall be floated, back blocked and tapered (except at perimeter of room).
- **B.** All ceiling edge joints shall be back blocked (except at perimeter of room).
- **C.** All side wall end joints shall be floated, back blocked and tapered.

2. Materials

- **A.** Backing blocks shall be ⅜" or ½" SHEETROCK* Gypsum Wallboard (not Insulating) manufactured by United States Gypsum Company.
- **B.** Adhesive shall be PERF-A-TAPE Cement (embedding type) manufactured by United States Gypsum Company.

3. Application

- **A.** All SHEETROCK Gypsum Wallboard shall be applied with the long edges at right angles to the framing. (Wood backing behind joints between framing supports is not required).
- **B.** When floated end joints are specified in Section 1, gypsum wallboards shall be so positioned that the end joints shall occur midway between supports and in accordance with directions published by the United States Gypsum Company.
- **C.** Backing blocks shall be applied where specified (Sections 1 A, B or C) in strict accordance with directions published by the United States Gypsum Company.

*T. M. Reg. U. S. Pat. Off.

CONCLUSION—The procedures previously described have been developed and used successfully. There are many possible variations which accomplish the same results. We have attempted to give you the basic principles involved. Any method incorporating these basic principles should prove equally satisfactory.

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