

# Complete Book of **Framing**

An Illustrated Guide for  
Residential Construction

**Scot Simpson**



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Second Edition  
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RSMMeans



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# ABOUT THE AUTHOR

Scot Simpson has been framing houses, schools, and commercial buildings for 39-years—and has owned a construction firm for 34-years. His firm, S.S. Framing, Inc., is based in Edmonds, WA. He developed and refined the methods in this book and uses them to train his crews. Scot is the author of two other construction books and many articles for construction magazines, such as *Fine Homebuilding* and the *Journal of Light Construction*. He developed and hosted the video, “Resisting the Forces of Earthquakes” with the Earthquake Engineering Research Institute and the International Conference of Building Officials.

Scot is a member of the International Code Council (ICC), the Construction Specifications Institute (CSI), the Associated General Contractors of America (AGC), and was 2006 Chairman of the ABC Framers Council. He has presented training and seminars for the National Association of Homebuilders, the American Forest and Paper Association, and the International Conference of Building Officials, among others, both in the U.S. and internationally.

Scot holds an MBA from Kent State University, as well as a BA and technical certificates in carpentry instruction, lumber grading, and industrial first aid.



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Bruce Simpson; Mars Simpson; Casey Miller; Paul Nelson; Allan R. Simpson, Jr.; John E. Farrier; APA, the Engineered Wood Association; The Association of Mechanical Engineers (ASME); Digital Canal Corporation; iLevel, a Weyerhaeuser Business, Boise, Idaho; The International Code Council (ICC); The Mason Contractors Association of America (MCAA); Sampson Lumber Company; The Simpson Strong-Tie Company; The Truss Plate Institute; the U.S. Geological Survey National Seismic Hazard Mapping Project; the Western Wood Products Association (WWPA); and Premier Building Systems.



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# INTRODUCTION

I'm a framing contractor. I've spent most of my career as a lead framer, directing my framing crews and training workers to become framers. In my teaching, I found that much of the information I needed was not available in a good book, so I wrote one, *Framing & Rough Carpentry*. As I started spending more of my time training and working with lead framers, I again looked for a good, easy-to-understand reference. I didn't find what I needed, so I wrote another book, *Advanced Framing Methods*, that provides all the information a framer needs to move up to the next level—becoming a lead framer. *The Complete Book of Framing* is the combination of those two books, updated with full-color illustrations and photographs, plus additional information—all presented in what I've come to think of as a “framer-friendly” format.

**If you're a novice with no framing experience**, you'll see the basics of framing shown in a simple, step-by-step style that makes it easy to learn. Where possible, I included both photographs and drawings for each step—for quick and complete learning. The advanced information will be more difficult for a novice to understand, but getting a good feel for the framing basics that come before it will help. The

more advanced tasks are also explained with photos and clear drawings.

**If you're already an experienced framer**, the book gives you some unique tools that you won't find anywhere else. For example, after struggling with rafters and rake walls for years, I developed a diagonal percent system that makes it easier. I use this for finding rafter lengths and rake wall stud heights. The book also explains all the “classic” methods for doing these tasks, but once you try the diagonal percent system, I doubt you'll go back to the old methods. Another example of the book's unique style of presentation is the layout language, which I developed for my first book.

**If you're a lead framer**, all the basic framing steps presented are important for reference and to help you teach and train crews. Most valuable, however, will be the guidance on managing a framing crew. Once you become a lead framer, your productivity is defined by the productivity of your crew. You'll need to think about the information they need and how to teach and manage them most effectively. Chapter 14 of this book is like a mini framer management course.



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The charts and graphs in the book present information that is needed to manage a framing crew, but is not readily available. For example, the *International Building Code* chart makes it easy to reference the latest information governing framing. The Standard Framing Dimensions chart gathers the information that you “sort-of” remember, but it helps to have it handy for quick reference.

This book covers all the major topics related to framing. Each is presented in the easiest learning method. Because the framing tasks are diverse and vary in complexity, the format also varies a little throughout the book. All of the topics are covered in a framer-friendly way.

Framing is very rewarding work, both physically and mentally. One of the biggest challenges, however, is getting accurate information every time so that you can be sure you’re framing a structure correctly. This book will assist you in that task.

Happy Framing,  
*Scot*

Note: This book is intended to provide useful information for understanding residential framing, but it is not a substitute for professional construction, engineering, or repair evaluations, recommendations, or services. Readers should obtain assistance from appropriate experts, as needed.

# Chapter One

# INTRODUCTION TO FRAMING



# Contents

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# Chapter One

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## INTRODUCTION TO FRAMING

The trade of wood framing comprises the rough carpentry skills needed to produce the “skeleton” of a building and its first layer of “skin.” The skeleton consists of the structural lumber forming the floors, walls, and roof. The skin consists of the lumber that encloses the skeleton and provides a surface for subsequent layers of protective and decorative finish materials.

This chapter is an illustrated review of a framer’s most basic tools, materials, and terminology. This basic information is often not even taught on the job site, so if you don’t know it when you arrive for work, you will have to play a guessing game or ask a lot of questions.

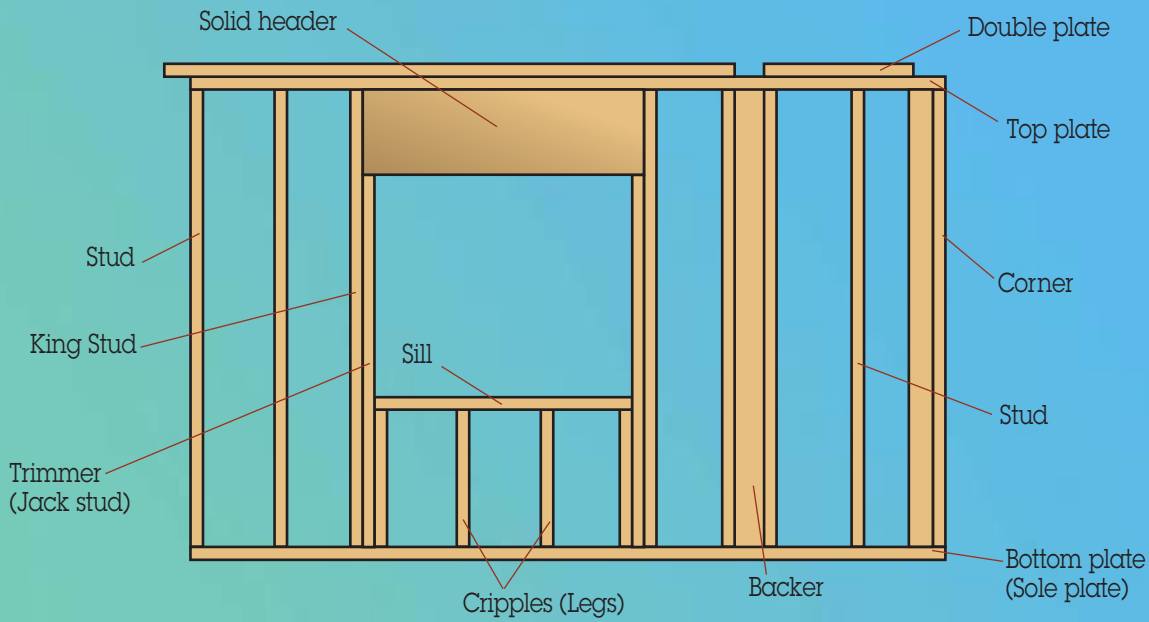
The detailed illustrations serve as a handy reference and help to reduce confusion when different words are used for the same item. Confusion can arise when framers move from job site to job site and work with different people. For example, bottom plates are often known as *sole plates*, backers as

*partitions*, and trimmers as *jack studs*. But it doesn’t matter what they are called as long as you know what they are. There is also a more detailed list of framing terms with definitions at the back of the book.

The suggested organization for a framing tool truck presented in this chapter is just an example of how a truck might be set up for tool storage. Its purpose is, once again, to reduce confusion and make the job easier. It is amazing how much time can be spent looking for tools and nails if they aren’t put where you expect them to be.

# Framing Terms

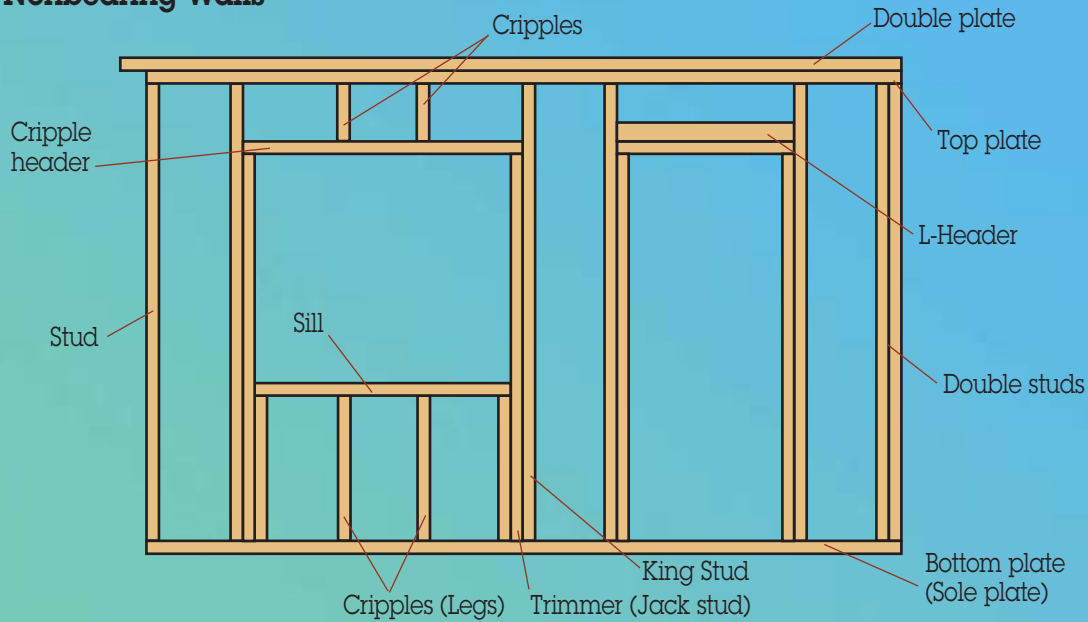
## Bearing Walls



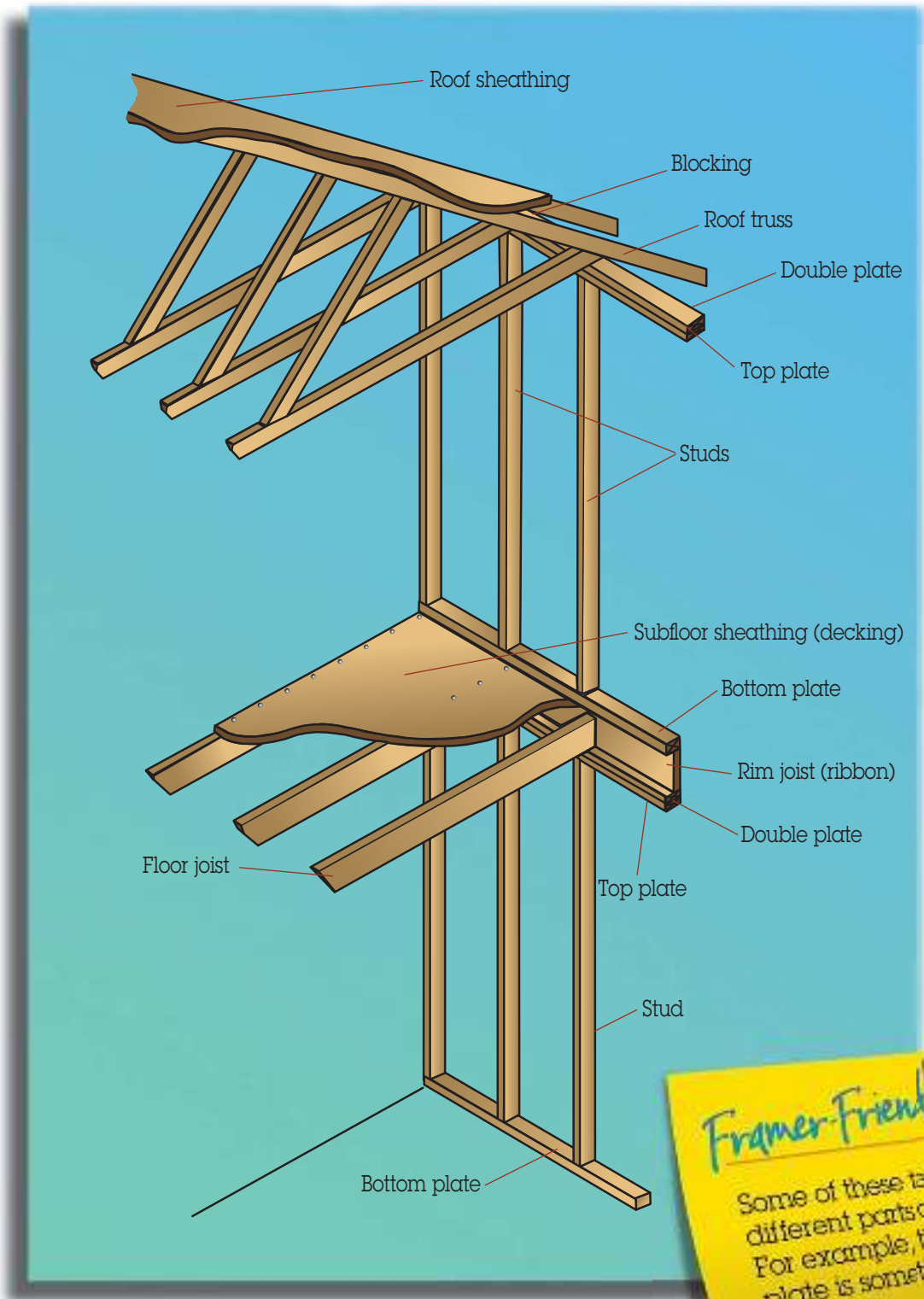
Bearing walls support the main weight of an upper portion of a building, such as a ceiling, floor, or roof. Nonbearing walls provide little or no support

to those upper portions. Remove nonbearing walls, and the upper portions will stand; remove bearing walls, and the upper portions will fall.

## Nonbearing Walls



# Framing Terms (continued)



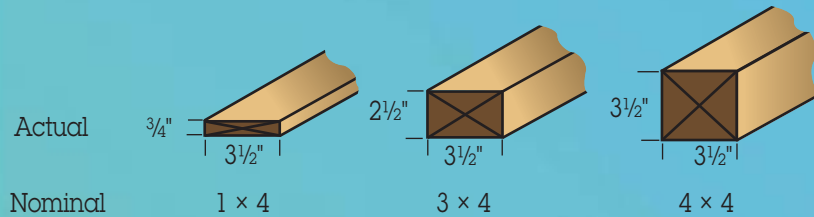
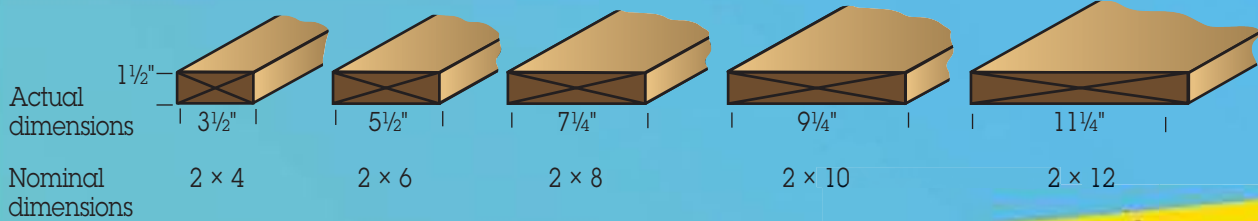
*Framer-Friendly Tips*

Some of these terms vary in different parts of the country. For example, the bottom plate is sometimes called the sole plate.

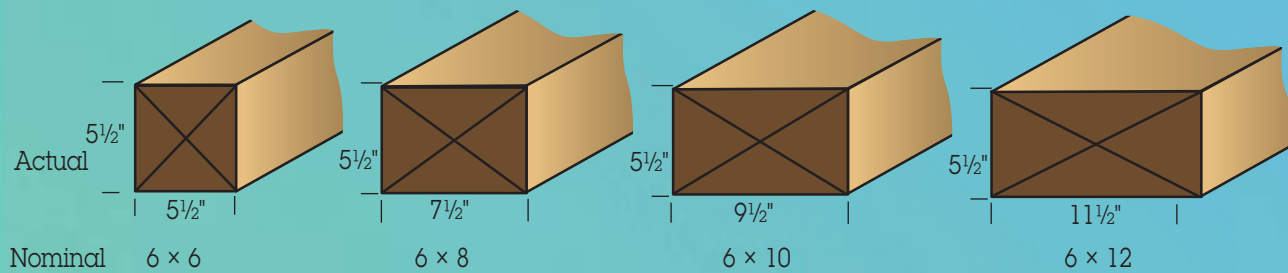
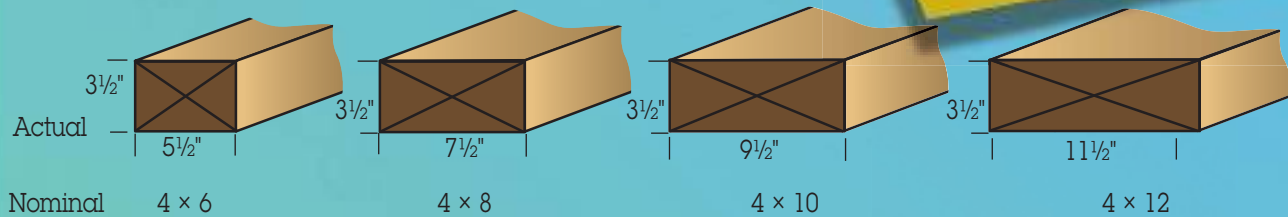
# Framing Lumber

Lumber is sized in "nominal," as opposed to "actual," dimensions. A nominal dimension rounds off the actual dimension to the next highest whole

number. For example, a piece of lumber that actually measures  $1\frac{1}{2}" \times 3\frac{1}{2}"$  is rounded off to the nominal  $2" \times 4"$ .



*Framer-Friendly Tips*  
At the mill, this lumber starts out as the actual dimensions, but after it has been surfaced, it is reduced to the nominal dimension.



# Framing Sheathing

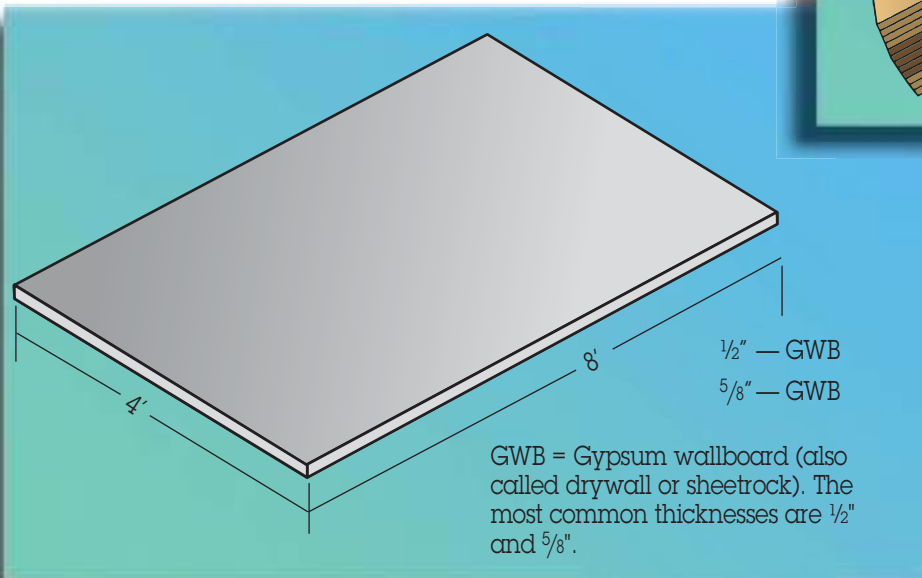
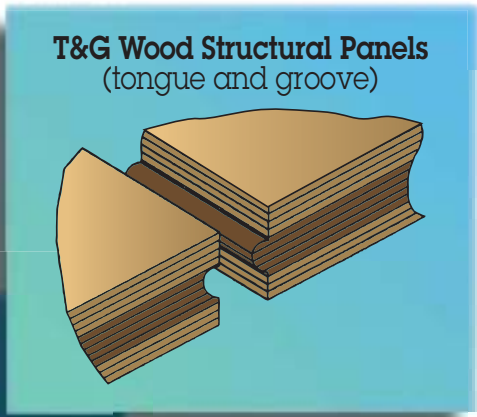
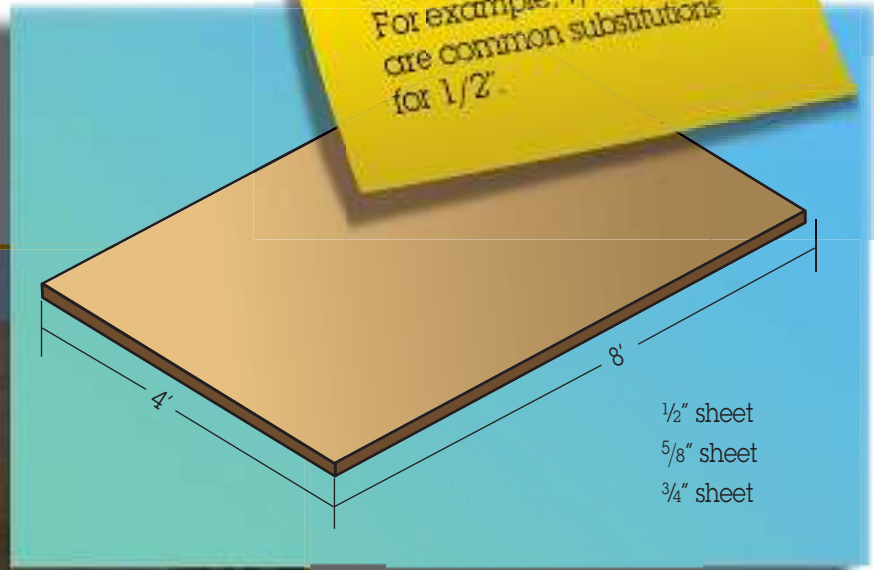
## Engineered Panel Products

Sheathing comes in 4' x 8' sheets. The thicknesses most commonly used in framing are 1/2", 5/8", and 3/4".



*The engineered panel products on this wall provide the strength needed for the high ceiling of this elementary school.*

*Framer-Friendly Tips*  
There are substitutions for these standard sizes. For example, 7/16" & 15/32" are common substitutions for 1/2".



*Although not as common in house framing, gypsum wallboard can be used on exterior walls, such as for apartments and condos, and commercial buildings for fire protection.*

Dens Glass® gypsum sheathing is a brand that has fiberglass mat, which provides mold and moisture resistance and is gold in color.



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