

# Finish Carpentry Quality Standards

by David Frane

Use this published standard  
to let clients know  
exactly how much quality  
a given price will buy

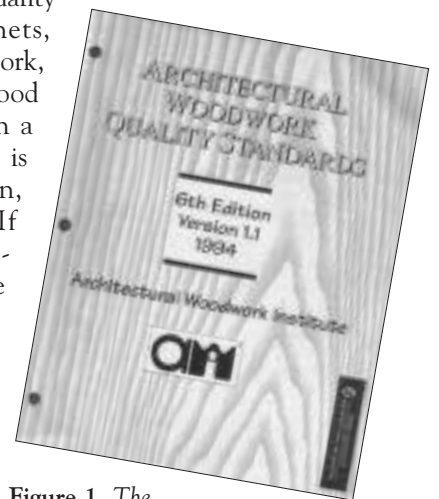


(This has long been standard practice on commercial projects.) Because we do top-quality work, we're not afraid of being held to high standards, but we want to make sure that everyone agrees what the standards are in advance. In other words, we don't want to promise museum-quality work to people paying bargain-basement prices.

## AWI Standards

The standards we use are called *Architectural Woodwork Quality Standards* (see Figure 1). They're published by the Architectural Woodwork Institute (AWI, 13924 Braddock Rd., Suite 100, Centreville, VA 22020; 703/222-1100). AWI is a trade group of architectural woodwork manufacturers. The book provides detailed quality specifications for cabinets, trim, paneling, veneer work, staircases, doors, and wood windows. It's revised on a regular basis. This article is based on the 6th edition, published in 1994. If you're doing an AWI-specified job, make sure you're working from the current edition.

The AWI book goes into a level of detail beyond that needed by most residential builders. But though much of the information in its 17 sections is aimed at manufacturers, a lot of it is use-



**Figure 1.** The author's company uses AWI's Architectural Woodwork Quality Standards to ensure that architect, client, and builder have the same quality expectations at the beginning of a job.

**P**rice and quality are as strongly linked as the moon and the tides. Like it or not, you and your clients make assumptions about quality every time you price a job — assumptions that don't always match. This was driven home to me a few years ago when I was a carpentry foreman on a house being built for a very difficult client. During the contract negotiations, the only thing he cared about was how much money he could shave from the budget. However, once the project was underway, he not only became interested in the details, but began inventing new ways to build things. He even inspected the millwork by shining a bright light on it from a distance of 6 inches. In the absence of agreed-upon standards, we were forced to argue with a stubborn and suspicious client about what is and isn't standard industry practice. Needless to say, this cost us money.

One of the results of this experience is that the company I work for will often ask the architect to reference published quality standards for millwork in the project specifications.



C. BATES

**Figure 2.** AWI specifies that all Custom and Premium trim stocks have a hollow on their back side. Called “backing out,” this helps the trim lie flat over irregular surfaces and lessens the chance that it will cup and withdraw the fasteners.



C. BATES

**Figure 3.** According to AWI standards, economy-grade trim, like this stock clamshell, can show as few as 15 knife cuts per inch. The material shown here is much coarser and should have been rejected.

ful to the trim carpenter, because it tells you what to look for in the products you buy and install. It’s also full of useful tables and drawings, and contains much information that’s impossible to find anywhere else. If the book says something is good practice, it probably is.

**Organization.** The use of AWI stan-

dards does require a learning curve. The information in the book is complex and can be overwhelming the first time through. Luckily, most carpenters don’t need to be familiar with the whole book. The sections I use most are “Lumber” (section 100), “Standing and Running Trim” (section 300), “Architectural Cabinets” (section 400), and “Stairwork and Rails” (section 800).

The most recent edition of the book also includes an “Installation of Woodwork” chapter (section 1700). Even if your plans never specify AWI standards, this section gives you a yardstick to measure the quality of your finish work. It serves as a quick reference for field-assembled components and includes everything from how big a gap is allowed in miter joints to whether you should cope or miter the inside corner of a crown molding.

It would be nice if the field carpenter on an AWI-specified job could get by knowing just the installation section. In my experience, however, it doesn’t work that way. This section isn’t as detailed as the rest of the book, and doesn’t contain all the information needed by a finish carpenter on an AWI-specified job. And while the installation standards usually match the standards listed in the main body of the book for plant-assembled components (tightness and flushness of miter joints, for example), there are places where they disagree. To avoid problems, you should have the architect specify which section is to have precedence.

**Using the book.** The first time I had to comply with *AWI Quality Standards*, I was afraid the architect would use them to tell me how to do my job. That does happen on occasion, but quality standards usually work in my favor by spelling out the assumptions I’m allowed to make. A few years ago an architect on an AWI-specified job told me that he expected all of the cedar trim on the outside of the house to be installed in full lengths — that is, without any scarf joints. I told him that while we would never case doors or windows with anything but full-length pieces, it’s standard procedure to mix short and long pieces for things like fascia, rakes, and clapboards. The architect wanted to argue the point. I pulled out the AWI book and showed him the section on Lumber. It stated that 15 feet, 8 inches was the maximum practical length avail-

able in cedar. As long as 10% of the boards supplied were that long, we were within our rights to make up the rest with shorter lengths.

### Levels of Quality

AWI groups all work into one of three quality categories: Economy, Custom, or Premium.

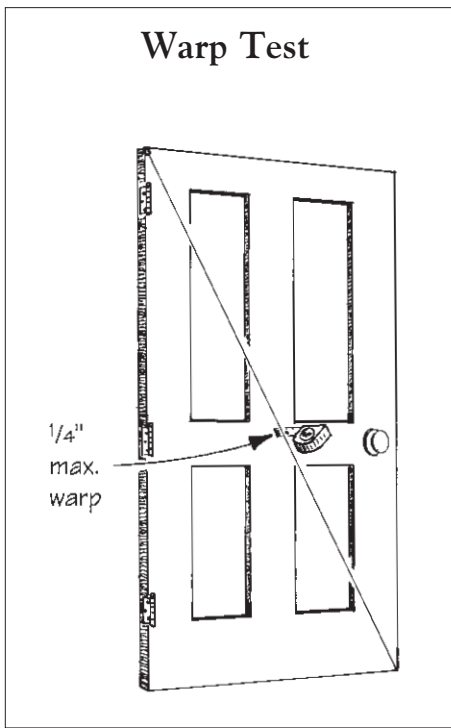
- **Economy-grade** work is what you expect to see in an entry-level tract house or condo. It’s what you get when price is more important than quality.
- **Custom-grade** is the level of workmanship you’ll find in a high-quality custom home. It’s specified for most architectural woodwork.
- **Premium-grade** is usually reserved for special projects, like custom-made curved staircases or rooms with mahogany raised panels. Premium-grade projects include lots of naturally finished woodwork. Molding profiles may be one-of-a-kind, and the wood carefully matched for grain pattern and color.

AWI applies these standards to the construction and installation of doors, windows, cabinets, and millwork. The standards dictate the materials used, the methods of construction, and the quality of fit and finish. Some examples follow.

### Millwork

Section 300 — “Standing and Running Trim” — covers what most trim carpenters do most of the time. This includes things like baseboards, cornices, and door and window casings. This section dictates the grade of lumber permitted, the quality of the finished surfaces, and the tightness of joints.

**Backed-out trim.** One of the things section 300 specifies is the cross-section of window and door casings. Most standard trim profiles come with a hollow cut on their back side (Figure 2). This is called “backing out,” and it serves two purposes: First, it allows a piece of trim to span lumps and bumps in the wall while still lying tight to the wall and jamb. Second, it weakens the stock so that nails are better able to hold it tight if it cups (the same reason that the backs of jambs and thresholds are kerfed). Custom and Premium trim must be backed out, including flat cas-

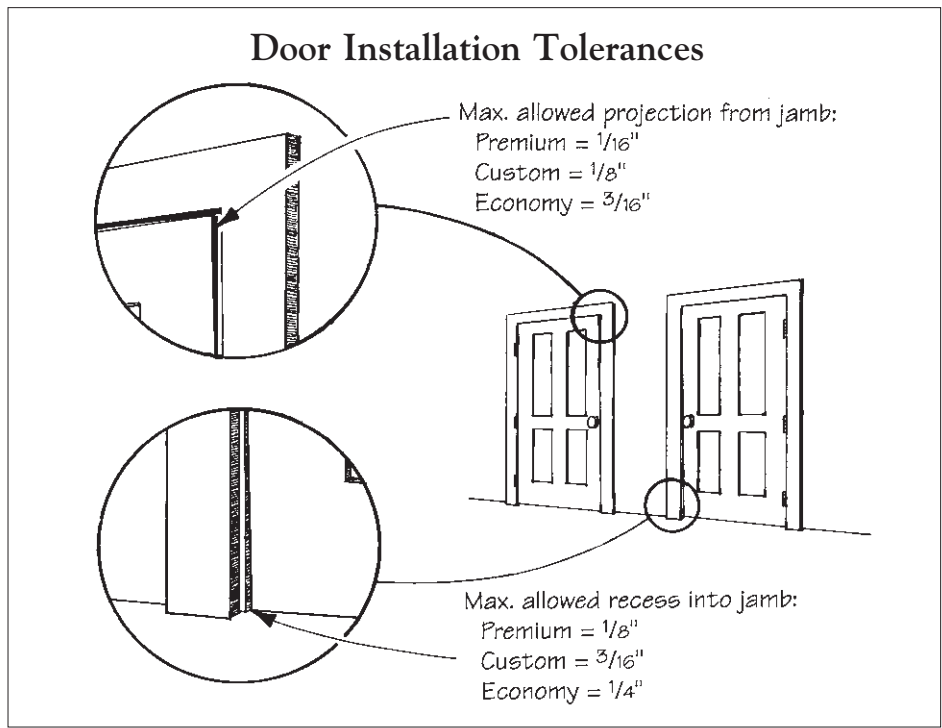


**Figure 4.** A door cannot deviate from flat more than  $\frac{1}{4}$  inch in any grade. To test this, place a straightedge or stretch a string diagonally from corner to corner on the door's concave face, then measure the gap.

ings and baseboards. (On large jobs, I can buy custom-milled poplar that's backed out for less than what the lumberyard charges for clear pine.) An exception to this rule is a board with exposed ends, like a skirtboard beneath a windowsill whose ends aren't returned to the wall with a miter. In Economy-grade work, no trim stock must be backed out.

**Joints.** Minimum requirements for fit and flushness of joints in trim work can be found in the installation section. In Premium-grade work, end-grain to end-grain joints, like butt and miter joints, must be reinforced with splines or biscuits. Custom-grade and Economy-grade joints don't need reinforcement.

**Surface quality.** Planers, molders, and shapers all have rotating cutter heads that take a series of dish-shaped cuts from the surface of a piece of wood as it's fed through the machine. Sometimes this leaves a washboard pattern (Figure 3). The number of knife cuts per inch, or KCPI, varies with how fast the stock is fed through the machine. When the stock is fed slowly, the knife cuts are small, closely spaced, and hard to see. When the stock is fed faster, the marks are larger and farther apart. In some cases the knife cuts can



**Figure 5.** Premium-grade doors may be recessed  $\frac{1}{8}$  inch into the jamb, but may project only  $\frac{1}{16}$  inch. Custom-grade doors may be recessed  $\frac{3}{16}$  inch and may project  $\frac{1}{8}$  inch. Economy-grade doors may be recessed  $\frac{1}{4}$  inch and can project  $\frac{3}{16}$  inch.

get so large and widely spaced that they're easy to see — especially after the finish is applied.

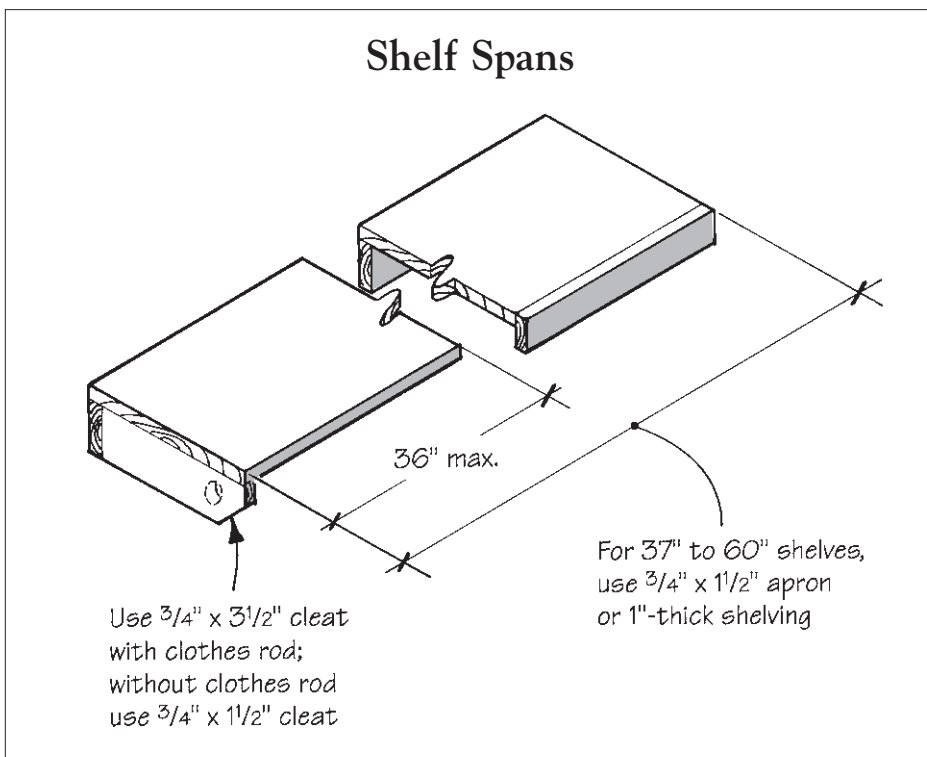
Because knife cuts and other minor defects are more visible on flat surfaces than on molded ones, AWI has different requirements for molding and flat trim. The installation section requires that no knife cuts be visible on Premium-grade work — flat surfaces must be sanded to 150 grit and molded surfaces to 120 grit. On Custom-grade work, 20 or more KCPI is acceptable on molded surfaces, while flat surfaces must be sanded to 120 grit. Economy-grade trim can show millmarks as coarse as 15 KCPI — no sanding is necessary.

## Doors

Carpenters don't make their own doors, but they do have to make sure that the doors they purchase meet the standards. Though the ideal door is perfectly flat, a certain amount of warp is inevitable in the real world. Section 1400 — "Stile and Rail Doors" — limits the maximum deviation from flat to  $\frac{1}{4}$  inch. To test this, place a straightedge or stretch a string diagonally across the door's concave face (Figure 4). Then measure the distance between the string and the face of the door.

The installation section also requires that top and bottom edges of all doors be sealed to protect them from moisture. Primer is porous, so it's a lousy sealer. It's better to seal door edges with two coats of enamel or polyurethane. If you need to trim the bottom of a door, remember to reseal it.

**Door installation.** The carpenter usually has some control over how the door sits in the jamb. Section 1700 sets the maximum gap between the edge of the door and the jamb at  $\frac{1}{16}$  inch for Premium,  $\frac{1}{8}$  inch for Custom, and  $\frac{3}{16}$  inch for Economy. Ideally, the face of a door should sit perfectly flush with the edge of the jamb at all points around the door. But when doors are not perfectly flat, jambs not perfectly straight, or walls not perfectly plumb, this may be impossible. If that's the case, it's less noticeable to recess the door into the jamb opening than to let it project past the jamb (Figure 5). In Premium-grade work, the face of any door may be recessed up to  $\frac{1}{8}$  inch, but may project only  $\frac{1}{16}$  inch. On Custom-grade work, doors may be recessed up to  $\frac{3}{16}$  inch and project  $\frac{1}{8}$  inch. In Economy-grade work, they can be recessed  $\frac{1}{4}$  inch and can project  $\frac{3}{16}$  inch. I usually install a prehung door plumb, then get it as



**Figure 6.** Under AWI guidelines, a 3/4-inch shelf may not span more than 36 inches unless it has a front apron. Beyond 60 inches, shelves must have intermediate supports that limit spans to 36 inches.

flush as possible by tweaking the jamb in or out.

### Cabinets and Shelving

Specifications for custom cabinets are often sketchy or incomplete at bid time. AWI specs tell the woodworker what level of detail is required. Section 400 — “Architectural Cabinets” — is aimed mostly at cabinet shops but also applies to finish carpenters doing fancy built-ins. The installation section tells the carpenter how to install shop-made cabinets.

**Gaps.** The ideal gap between adjacent cabinet doors, drawers, and panels is 1/8 inch, and AWI sets a maximum variation from this ideal for each grade. Custom-grade gaps may vary by 1/16 inch, Premium by 1/32 inch, and Economy by 3/32 inch. (This makes the maximum door gap on a Custom job 3/16 inch, and the minimum 1/16 inch.)

Doors and drawer fronts aren’t always perfectly flush to one another or to face frames. In Premium work, the maximum variation from flushness is 1/16 inch in Premium-grade work, 1/8 inch in Custom, and 3/16 inch in Economy.

**Installation.** The installation section tells the carpenter whether countertops, toe kicks, backsplashes, and other com-

ponents must be scribed in place. It also sets standards for fastening. In Premium-grade work, for instance, open cabinets (without doors) must be fastened to the wall with concealed fasteners — visible screws or plugs aren’t permitted. In Custom and Economy, it’s alright if the fasteners show.

**Utility shelving.** Section 600 gives specifications for “Closet and Utility Shelving.” It includes minimums for shelf size and deflection, as well as specifying how shelves are to be fastened in place (Figure 6).

### Stairs

The installation section defers all stair specs to section 800 — “Stairwork and Rails.” All stairs must conform to local building codes, but beyond that there are many ways to build them. Custom-grade stairs are built on rough carriages and trimmed with finish wall stringers — usually 1x12s slipped between the rough carriage and wall. On Custom-grade stairs, you can butt the treads and risers to this wall stringer. But since walls are seldom perfectly straight, the ends of most treads and risers will have to be scribed. Many finish carpenters slot the wall stringer to accept the risers, then shim them for-

ward to create tight joints. On closed-stringer stairs this lets you wedge the treads into place without opening the joint between the stringer and the riser.

On Premium-grade staircases, the ends of all treads and risers must be completely housed in the wall stringers. Once the treads and risers are wedged tight, they should be perfect. The back edge of the treads must also fit into a dado in the underside of the riser. This ensures tight joints between treads and risers, even if the treads shrink a bit. Because of these strict standards, Premium-grade stairs are usually made off site and dropped into place more or less complete.

### The Payoff

This is only a sampling of what’s in AWI’s *Quality Standards*. We’ve found that when the carpenters become familiar with the information in this book, they produce work that’s more uniform in quality. The standards have taken the guesswork out of what is and isn’t good enough, and have helped identify us as quality builders. Because many architects routinely reference AWI’s *Quality Standards* in their specs, we have a competitive advantage when bidding against builders who aren’t familiar with them.

Although I first viewed the standards as a straight jacket, they’ve actually given me leeway in deciding how to build things, as long as I meet the requirements of the grade of work I’m doing. Of course, it’s permissible to do work that’s better than what’s required. For example, I can buy dovetailed solid maple drawers from a local shop for about what it costs me to build and finish plywood drawers. I’ve yet to hear any complaints from clients who got dovetailed drawers instead of plywood ones.

The standards also don’t inhibit the normal give and take between client and builder. The client is free to negotiate deviations from the strict rules of a particular grade, trading higher standards in one place for looser standards in another. If both parties benefit, great. After all, no one wins when specifications are used as a bludgeon. Quality standards are supposed to increase the level of agreement, not the level of contention. ■

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