

# INSTALLATION OF WOODWORK

SECTION  
1700



## General Criteria

### 1700-G-1

#### Scope

This section defines the Standards for the installation of architectural woodwork, casework, and related woodwork elements.

Performance:

Installation shall be by the woodwork fabricator or a company specializing in the installation of architectural woodwork and casework or the general contractor.

The firm accepting responsibility for the installation shall employ experienced craftspersons who can complete the work per the Grade specified and defined by this standard.

The installer shall check all architectural woodwork and/or casework supplied as compliant with applicable sections of this standard, or as modified by the contract documents, for the Grade specified. The installer shall also be familiar with the woodwork shop drawings and their relationship to the completed work.

Premium Grade installation shall be by inconspicuous means.

Includes:

- The installation of architectural woodwork. (The fabrication and finishing of the woodwork is covered in previous sections.)
- Installation of woodwork under this Standard shall include labor, tools, equipment, adhesives, fasteners, common external blocking, furring and hanging devices for the support or attachment of the woodwork.

The installer shall be responsible for:

- Receiving and distributing woodwork to the proper location.;
- Installation of finish hardware not furnished by the manufacturer;
- Installation of adjustable shelves, standards and brackets on building walls, and shelf clips or pins in cabinets, cabinet standards and/or in-line boring done by manufacturer;
- On prefinished woodwork, all the filling of nail holes and touch up on the prefinished woodwork after installation to achieve best color blend;
- Preparation of walls for paneling included in contract, including installation of 19 mm x 64 mm [ $\frac{3}{4}$  x 2- $\frac{1}{2}$ "] minimum veneer core plywood or solid wood grounds, and/or extruded aluminum strips and clips; set plumb and true, squaring out corners, windows and door openings up to and including 12.5 mm [ $\frac{1}{2}$ "].

Excludes:

Unless required by the specifications and/or a specific requirement of this section of the Standards to follow, the installer shall not:

- Provide structural grounds or blocking inside partitions or above finished ceiling or below finished floor;
- Supply exposed materials other than wood, solid surfacing, or plastic laminate;
- Factory or site-applied finish to unfinished or primed woodwork;
- Fill nail or screw holes in *unfinished or primed woodwork*;
- Caulk to fill between woodwork and any wall, floor, and/or ceiling imperfections;
- Prepare wall, floor, or ceiling to accept the woodwork;
- Install electrical, telephone, plumbing, computer, or mechanical equipment to include grommets and wire management;
- Supply electrical power, water, hoisting, sanitary or waste disposal services;
- Supply fastening devices unrelated to the architectural woodwork being installed;
- Provide "buildups" to level floor or walls in excess of 12.5 mm [ $\frac{1}{2}$ "] at any one point; or
- Seal edges, tops and/or bottoms of wood doors.

### 1700-G-2

#### Specification Requirements

##### GRADE MUST BE SPECIFIED

These Quality Standards Illustrated provide for three Grades: Premium, Custom, and Economy.

##### Premium Grade

The Grade specified when the highest degree of control over the quality of workmanship, materials, installation and execution of the design intent is required. Usually reserved for special projects, or feature areas within a project.

##### Custom Grade

The Grade specified for most conventional architectural woodwork. This Grade provides a well-defined degree of control over the quality of workmanship, materials and installation of a project. The vast majority of all work produced is Custom Grade.

##### Economy Grade

The Grade which defines the minimum expectation of quality, workmanship, materials, and installation within the scope of these standards.

## Prevailing Grade

When the Quality Standards Illustrated are referenced as a part of the contract documents and no Grade is specified, Custom Grade standards shall prevail. In the absence of specifications or requirements of this Standard, materials shall be unfinished mill option lumber or veneers suitable for opaque finish, with mill option hardware, fasteners, adhesives, overlays, and specialty items.

### Drawings and specifications shall define:

- A. The QSI Grade of Work required;
- B. The method of anchoring all architectural woodwork items, including trim, paneling, cabinets, plastic and laboratory tops, and specialty items;
- C. The type, size, frequency, and/or spacing of anchoring devices and fasteners;
- D. The clearance at bottom of wood doors to accommodate floor coverings; and
- E. Whether priming or backpriming is required and, if so, by whom.

## 1700-G-3

### Site Conditions, Materials, and Preparation

It is the responsibility of the general contractor to insure the following site conditions which are required for the installation to meet these Quality Standards Illustrated.

- A. Walls, ceilings, floors, and openings must be level, plumb, straight, in-line, and square.



**Note:** In the absence of floor tolerances in the contract documents, variance of a cabinet's toe base height due to floor variations is not a defect. Casework is required to be installed level. Shimming of toe base, not to exceed 12.5 mm [ $1/2$ "], is acceptable. Floor variations exceeding 12.5 mm [ $1/2$ "] shall be corrected before cabinets are installed. Wall panel installations are subject to the same tolerances at wall or ceiling. Correction is not the responsibility of the manufacturer or installer.

- B. Prior to delivery and installation of architectural woodwork, casework and related woodwork, to the job site, the building environment shall be stabilized to provide condition that will maintain a relative humidity of not less than 25%, nor more than 55%.



**Note:** These parameters apply for most of North America. See the data at the end of this section on relative humidity and moisture content for specific guidelines. In any event, relative humidity during the time of installation shall remain within the range to be maintained during occupancy.

All woods are affected by humidity, which is the water/moisture, in vapor form, in the atmosphere, but not appreciably by heat. Lumber swells and shrinks, primarily in two directions only, thickness and width, and insignificantly in length. These changes

in dimension, due to effects of humidity, vary with different species. Providing and maintaining a stable environment, from the time of delivery, through installation, and on through building occupancy, is the key to minimizing the effects of humidity.

- C. Areas to receive architectural woodwork must be fully enclosed with windows installed and glazed, exterior doors in place, HVAC systems operational, and temporary openings closed. All plaster, wet grinding, and concrete work shall be fully dry.

- D. A secure storage area must be provided within the building that is flat and level, clean, dry, well ventilated, protected from direct sunlight, and broom clean.

- E. Unless specified as part of the installer's contract, it is the responsibility of the general contractor to furnish and install structure, grounds, and blocking, or other anchorage which become part of the walls, floors, or ceilings, required for architectural woodwork installation.

- F. All metal backing strips welded to steel studs shall be as specified and/or detailed on architectural/design drawings to show locations and gauge of thickness of these items.

- G. Should the architect, designer, or engineer omit details calling for the general contractor to supply necessary blocking or backing strips in the wall, either through inadvertence or otherwise, the architectural woodwork installer shall not proceed with the installation until such time as the blocking is installed by others. The owner or owner's general contractor is responsible for placing blocking acceptable to the woodwork installer prior to installation with no penalty to the woodwork manufacturer or installer.

- H. All preparatory work done by others shall be subject to inspection by the architectural woodwork installer, and may be accepted or rejected prior to commencing installation.

- I. Rough openings which are installed by others prior to commencement of installation shall be built square, in plane, and to the proper dimensions.

*Architectural woodwork is a "finish" trade, and should be installed after ceilings, plumbing, flooring, etc. The fabricator of the work shall not be held responsible for any damage that might develop by others not adhering to the above procedures.*

## 1700-G-4

### Delivery and Storage Requirement

Architectural woodwork shall be delivered to the jobsite only after all painting, wet work, grinding, and similar operations are completed. For most areas of North America, the ambient relative humidity at the site, including both the storage and the installation areas, should be maintained between 25% and 55% prior to delivery and through the life of the installation. In any event, the range of relative humidity change should not exceed 30 percentage points. Relative humidity below 20% and above 80% is particularly harmful to wood and wood products, not to mention fabrics, ceiling materials, and flooring, wall coverings and the human inhabitants.

### 1700-G-5

#### Installation (when specified)

The methods and skill involved in the installation of woodwork in large measure determine the final appearance of the project. Architectural woodwork shall be allowed to come to equilibrium on site prior to installation. A minimum of 72 hours shall be allowed for best results. Factory finished woodwork will require a week or more to acclimatize. The design, detailing and fabrication should be directed toward achieving installation with a minimum of exposed face fastening. The use of interlocking wood cleats or metal hanging clips combined with accurate furring and shimming will accomplish this. Such hanging of woodwork has the additional advantage of permitting movement that results from humidity changes or building movement.

### 1700-G-6

#### Finishing (when specified)

This section does not cover finishing. However, site conditions for finishing are rarely conducive to good results. Poor lighting, dust-laden air, and available techniques are limiting factors. In many areas woodworkers will factory finish, yielding better results than can be achieved from field finishing.

*Priming and back priming are the responsibility of the general contractor unless specified otherwise.*

When projects are factory finished under Section 1500, field touch-up is the responsibility of the installing contractor, and includes the filling and touch-up of exposed job-made nail or screw holes, refinishing of raw surfaces resulting from job fitting, repair of job-inflicted scratches and mars, and final cleaning of the finished surfaces. The prefinisher may be contracted to supply touch-up materials by special arrangement and agreement between the finisher and the general contractor.

### 1700-G-7

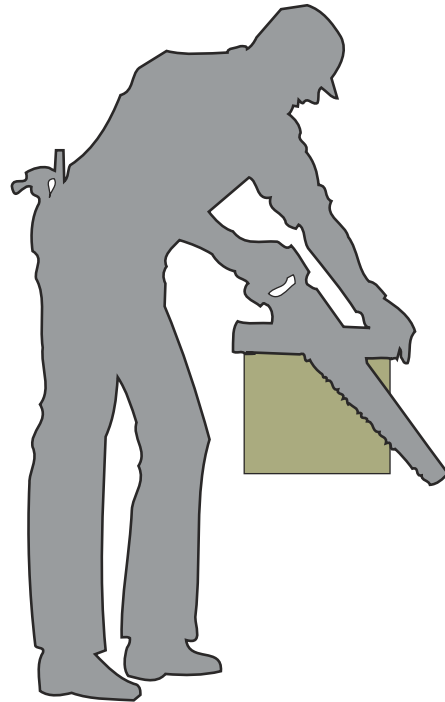
#### Fire-Retardant Ratings (when specified)

It is the responsibility of the specifier to research local codes and to indicate what fire-retardant rating, if any, is required for the specific items and classifications of the woodwork. (See Sections 100 and 200 regarding fire-retardant materials.)

In the absence of such a specified rating, the woodworker shall supply, and the installer shall install, unrated woodwork.

### Recommendations which follow

The illustrations of Sections 1700-G-8 through G-10 do not represent the only possible, practical, or appropriate engineering solutions for the issues shown. Design professionals and woodworking professionals often work together to create innovative solutions for installation. Solutions proposed by responsible parties shall not be deemed inappropriate merely because they are not shown in the QSI. Variance from compliance with the QSI can be, and often is, granted by the design authority or owner.



1700-G-8

Hanging Cleat Recommendations

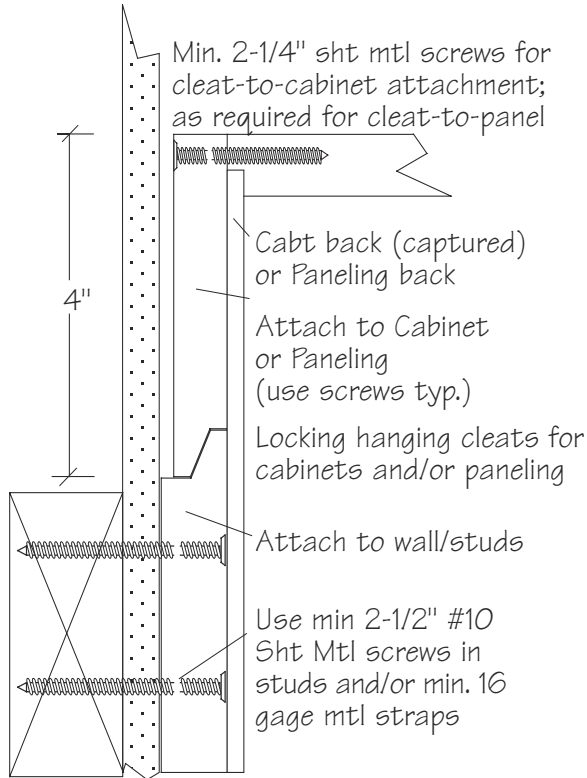


Figure 1700-01 - Cabinet or Panel Hanging

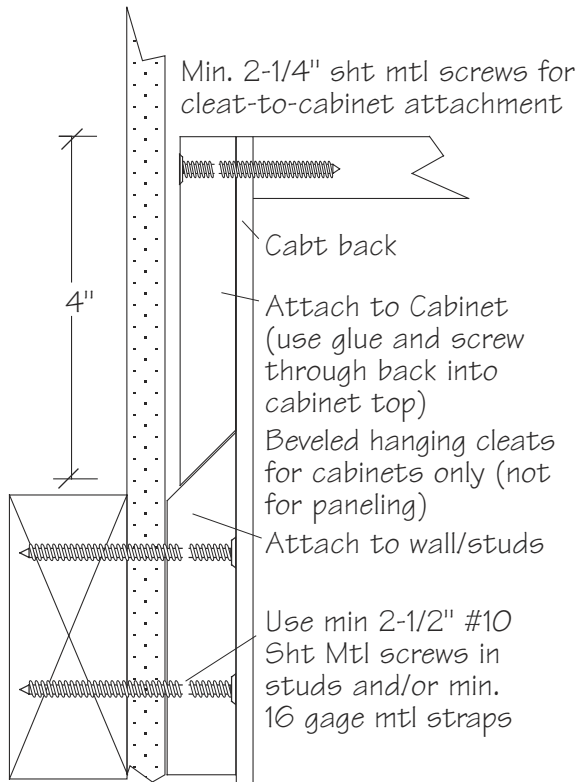


Figure 1700-02 - Cabinet Hanging

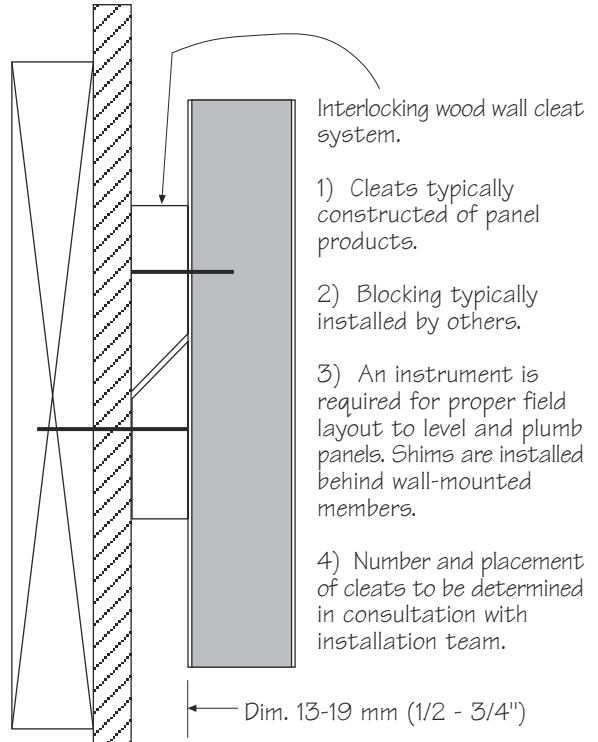


Figure 1700-03 - Wood Interlock

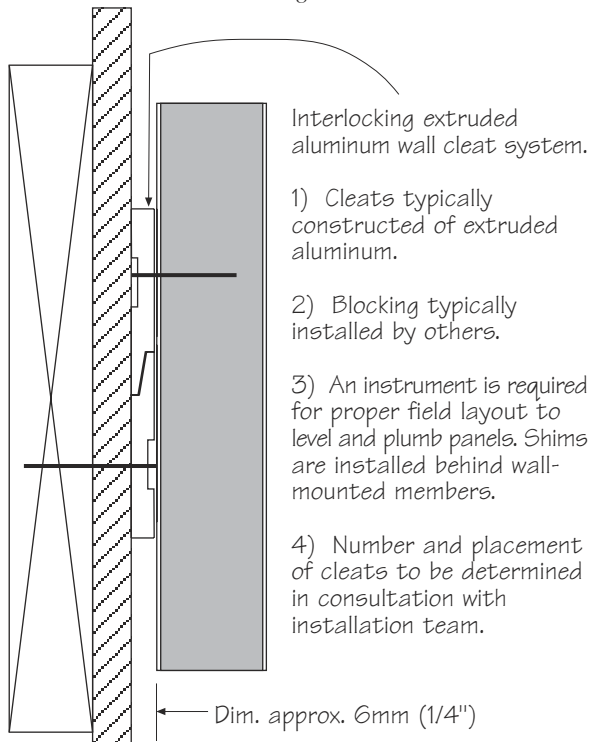


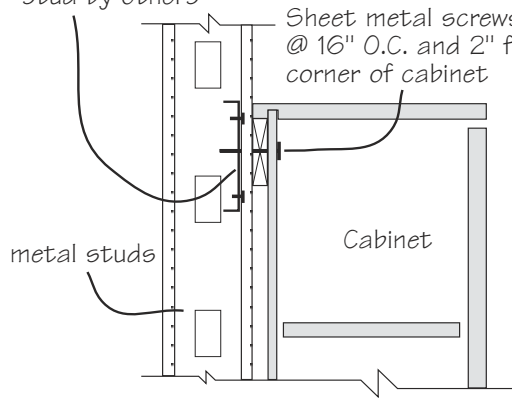
Figure 1700-04 - Aluminum Interlock

1700-G-9

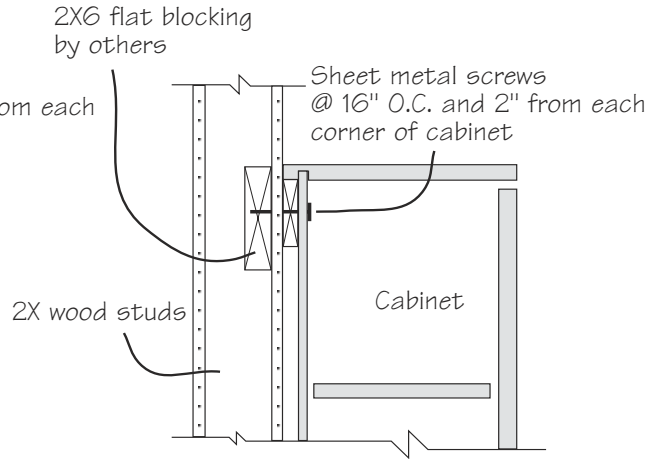
Cabinet Fastening Recommendations

6" X 16 ga. cont.  
sheet metal at studs,  
2 sheet metal  
screws at each  
stud by others

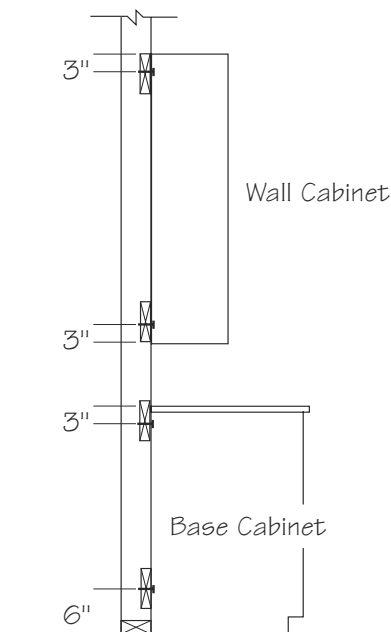
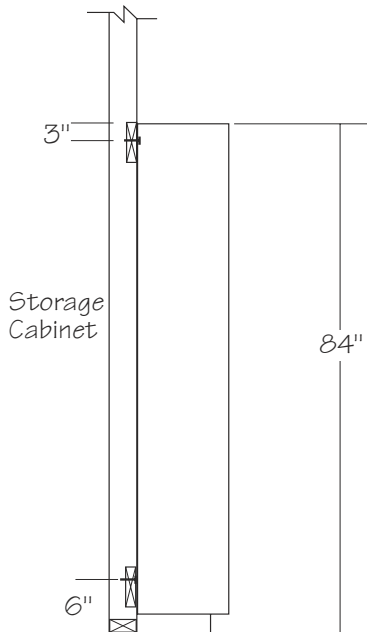
NOTE: These techniques are not approved for seismic areas.



Typical at Metal Stud Walls



Typical at Wood Stud Walls

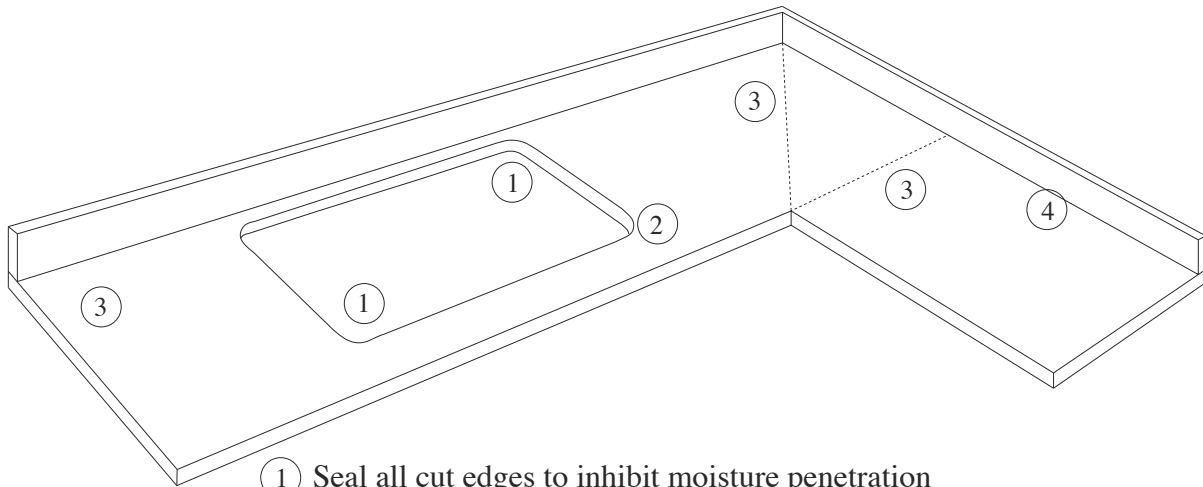


Typical Cabinet Fastening Details - In-wall Blocking usually by General Contractor

Figure 1700-05 - Fastening

1700-G-10

HPDL Countertop Requirements



- ① Seal all cut edges to inhibit moisture penetration  
NOTE: Use of pigment in the sealant will facilitate confirmation.
- ② Radius cut outs to minimize stress fractures
- ③ Locate joints in HPDL and substrate at least 460 mm [18"] from sink, unless design criteria locates sink within this dimension of corner joint or change of direction of top. Seal joints watertight when within 1220 mm [48"] of sink cut outs for any Grade of Work.
- ④ Seal backsplash to top with caulk or silicone:  
Required at fabrication when factory assembled Premium Grade  
Required at installation for Premium and Custom Grade  
Mill/Installer's option for Economy Grade

Figure 1700-06 - 1700 Counter Seams

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## Technical Criteria

### 1700-T-1

In the absence of details or specifications to the contrary, the following shall apply. When required, the installer shall submit evidence of having adequate equipment and experienced craftspersons to complete the installation. Section-specific standards take precedence over general installation standards in the following tables.

All architectural woodwork fabricated in accordance with the various sections of the Quality Standards Illustrated shall be installed by skilled mechanics under the proper supervision of the installer supervisor, who will cooperate with the general contractor and other crafts to produce satisfactory installation.

The woodwork installer shall:

- Inspect all preparatory work done by others, and shall accept or reject conditions prior to installation;
- Be responsible to receive and distribute woodwork to its proper locations; (The architectural woodwork should be acclimated to these conditions for a minimum of 72 hours prior to installation. This will usually allow the wood to come to equilibrium with the environment. The fabricator of the woodwork shall not be held responsible for any damage that might develop by others not adhering to the above storage recommendations.);
- Review manufacturer's shop drawings and coordinate with architectural drawings and job site conditions;
- Prior to cutting standing and running trim, inspect all material for its compatibility to meet the specified standards for grain and color;
- Provide all cutouts through woodwork necessary to neatly accommodate electrical, telephone, mechanical, or plumbing equipment (beyond wire chases);
- Fasten and anchor all items as specified; (All nails on Exposed and Semi-exposed surfaces must be countersunk. On all prefinished woodwork installations, do all filling of nail holes and touch-up on prefinished woodwork with blending filler. Job-finished woodwork to be filled by paint finisher.)
- Avoid open joints, visible machine marks, tears, nicks, chips, scratches and/or sanding cross-scratches greater than tolerances allowed by this standard.
- Cut and fit so that natural characteristics shall not exceed those allowed in Section 100 and Section 200 for the Grade of work specified;
- Install woodwork shall be level and plumb within specified tolerances; and
- Clean/remove adhesives of any type remaining on Exposed or Semi-exposed surfaces.



**VARIATION NOTE:** Due to deviations in existing buildings and a lack of clear performance standards for framing and drywall, gaps between standing and running trim at building walls and ceilings shall not be the responsibility of the millwork installer.



**GAP, FILLING and CAULKING NOTE:** The gap tolerances are as measured at the highest surface or plane (except when v-grooves or reveals are part of the design aesthetic) before the addition of commercial fillers or caulk for cosmetic purposes.

1700-T-2

Table of General Installation Standards (reads across both pages ----->)

General Standards - Apply to all Sections of Work						
Grade and Description	Smoothness minimum	Sanding cross scratch (by finish type)		Flushness Variation	Gap Width	Gap Length
		Transparent	Opaque	Max. allowed	Max. allowed	Max. allowed
<b>Field Joints Wood-to-Wood - Up to 3 m [118"] above finished floor, balcony, deck or walkway customarily exposed to view and open to the building occupants and/or general public</b>						
<b>Premium Grade</b>						
Flat Surface	150 grit	None	0.65 mm. [0.025"]	0.3 mm [0.012"]	0.3 mm [0.012"]	30% joint
Shaped Surface	120 grit	0.65 mm. [0.025"]	1.3 mm. [0.050"]	0.65 mm. [0.025"]	0.65 mm. [0.025"]	30% joint
<b>Custom Grade</b>						
Flat Surface	120 grit	None	0.65 mm. [0.025"]	0.65 mm. [0.025"]	0.65 mm. [0.025"]	30% joint
Shaped Surface	20 KCPI	*	*	1.3 mm. [0.050"]	1.3 mm. [0.050"]	30% joint
<b>Economy Grade</b>						
Flat Surface	15 KCPI	*	*	1.3 mm. [0.050"]	1.3 mm. [0.050"]	30% joint
Shaped Surface	15 KCPI	*	*	1.9 mm [0.075"]	1.9 mm [0.075"]	30% joint
<b>Field Joints Wood-to-Non-Wood - Up to 118" [3 m] above finished floor, balcony, deck or walkway customarily exposed to view and open to the building occupants and/or general public</b>						
<b>Premium Grade</b>						
Flat Surface	*	*	*	0.65 mm. [0.025"]	0.65 mm. [0.025"]	30% joint
Shaped Surface	*	*	*	1.3 mm. [0.050"]	1.3 mm. [0.050"]	30% joint
<b>Custom Grade</b>						
Flat Surface	*	*	*	1.3 mm. [0.050"]	1.3 mm. [0.050"]	30% joint
Shaped Surface	*	*	*	1.9 mm [0.075"]	1.9 mm [0.075"]	30% joint
<b>Economy Grade</b>						
Flat Surface	*	*	*	1.9 mm [0.075"]	1.9 mm [0.075"]	30% joint
Shaped Surface	*	*	*	2.5 mm [0.100"]	2.5 mm [0.100"]	30% joint
<b>Field Joints Non-Wood-to-Non-Wood - Up to 118" [3 m] above finished floor, balcony, deck or walkway customarily exposed to view and open to the building occupants and/or general public</b>						
<b>Premium Grade</b>						
Flat Surface	*	*	*	1.3 mm. [0.050"]	1.3 mm. [0.050"]	30% joint
Shaped Surface	*	*	*	1.9 mm [0.075"]	1.9 mm [0.075"]	30% joint
<b>Custom Grade</b>						
Flat Surface	*	*	*	1.9 mm [0.075"]	1.9 mm [0.075"]	30% joint
Shaped Surface	*	*	*	2.5 mm [0.100"]	2.5 mm [0.100"]	30% joint
<b>Economy Grade</b>						
Flat Surface	*	*	*	2.5 mm [0.100"]	2.5 mm [0.100"]	30% joint
Shaped Surface	*	*	*	3.2 mm [0.125"]	3.2 mm [0.125"]	30% joint
<b>Field Joints All Elements - Above 3 m [118"] above finished floor, balcony, deck or walkway customarily exposed to view and open to the building occupants and/or general public</b>						
<b>Premium Grade</b>						
Flat Surface	20 KCPI	*	*	1.3 mm. [0.050"]	1.3 mm. [0.050"]	30% joint
Shaped Surface	20 KCPI	*	*	1.9 mm [0.075"]	1.9 mm [0.075"]	30% joint
<b>Custom Grade</b>						
Flat Surface	20 KCPI	*	*	1.9 mm [0.075"]	1.9 mm [0.075"]	30% joint
Shaped Surface	20 KCPI	*	*	2.5 mm [0.100"]	2.5 mm [0.100"]	30% joint
<b>Economy Grade</b>						
Flat Surface	15 KCPI	*	*	2.5 mm [0.100"]	2.5 mm [0.100"]	30% joint
Shaped Surface	15 KCPI	*	*	3.2 mm [0.125"]	3.2 mm [0.125"]	30% joint

\* Indicates there is no minimum, maximum, or the test does not apply to this element.

General Standards - Apply to all Sections of Work													
Cup	Twist	Bow	Warp	Scribe to adjacent surface	Visible finish nails	Visible trim screws	Glue or Adhsv. Required	Wood Plug	Filler, wood insert	Filler, putty	Filler, wax	Well Matched	Compat-ible
<b>Field Joints Wood-to-Wood - Up to 3 m [118"] above finished floor, balcony, deck or walkway customarily exposed to view and open to the building occupants and/or general public</b>													
<b>Premium Grade</b>													
None	None	None	None	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	*
*	*	*	*	Yes	No	No	Yes	Yes	Yes	No	Yes	Yes	*
<b>Custom Grade</b>													
None	None	None	None	Yes	No	No	Yes	Yes	Yes	No	Yes	*	Yes
*	*	*	*	No	Yes	Yes	No	No	Yes	Yes	Yes	*	Yes
<b>Economy Grade</b>													
*	*	*	*	No	Yes	Yes	No	No	Yes	Yes	Yes	*	*
*	*	*	*	No	Yes	Yes	No	No	Yes	Yes	Yes	*	*
<b>Field Joints Wood-to-Non-Wood - Up to 3 m [118"] above finished floor, balcony, deck or walkway customarily exposed to view and open to the building occupants and/or general public</b>													
<b>Premium Grade</b>													
None	None	None	None	Yes	No	No	Yes	*	*	*	*	*	*
*	*	*	*	Yes	No	No	Yes	*	*	*	*	*	*
<b>Custom Grade</b>													
None	None	None	None	Yes	No	No	Yes	*	*	*	*	*	*
*	*	*	*	No	Yes	Yes	No	*	*	*	*	*	*
<b>Economy Grade</b>													
*	*	*	*	No	Yes	Yes	No	*	*	*	*	*	*
*	*	*	*	No	Yes	Yes	No	*	*	*	*	*	*
<b>Field Joints Non-Wood-to-Non-Wood - Up to 3 m [118"] above finished floor, balcony, deck or walkway customarily exposed to view and open to the building occupants and/or general public</b>													
<b>Premium Grade</b>													
None	None	None	None	No	No	Yes	Yes	*	*	*	*	*	*
*	*	*	*	No	No	Yes	Yes	*	*	*	*	*	*
<b>Custom Grade</b>													
None	None	None	None	No	No	Yes	Yes	*	*	*	*	*	*
*	*	*	*	No	No	Yes	Yes	*	*	*	*	*	*
<b>Economy Grade</b>													
*	*	*	*	No	No	Yes	Yes	*	*	*	*	*	*
*	*	*	*	No	No	Yes	Yes	*	*	*	*	*	*
<b>Field Joints All Elements - Above 3 m [118"] above finished floor, balcony, deck or walkway customarily exposed to view and open to the building occupants and/or general public</b>													
<b>Premium Grade</b>													
None	None	None	None	No	No	Yes	Yes	*	*	*	*	*	*
*	*	*	*	No	No	Yes	Yes	*	*	*	*	*	*
<b>Custom Grade</b>													
None	None	None	None	No	No	Yes	Yes	*	*	*	*	*	*
*	*	*	*	No	No	Yes	Yes	*	*	*	*	*	*
<b>Economy Grade</b>													
*	*	*	*	No	No	Yes	Yes	*	*	*	*	*	*
*	*	*	*	No	No	Yes	Yes	*	*	*	*	*	*

\* Indicates there is no requirement or the test does not apply to this element.

### 1700-T-3

#### Tables of Section Installation Standards



**Note: The following Section-specific Standards supersede the General Standards on the previous two pages.**

In the absence of specifications, the following standards will apply. Where more than one method or material is listed, AWI/AWMAC woodworkers will supply their choice from the alternatives.

- Standards are separated by function: Required or Not Required; Permitted or Not Permitted, as appropriate.
- Items deemed Not Required shall be performed at the option of the installer.
- Items deemed Permitted shall be accomplished when practical at the option of the installer.
- Items deemed Not Permitted shall not be performed in the absence of direct specification or bulletin.
- When the installer chooses to use a process of a higher grade than specified, it is permitted.
- Upon completion of the installation, shims and grounds shall not be visible, the installer shall clean all items of pencil or ink marks, excess adhesive, etc., and the area of his operations shall be broom clean, depositing debris in containers provided by the General Contractor.
- Open joints, visible machine marks, cross sanding, tears, nicks, chips, and/or scratches shall not be permitted unless part of the design aesthetic, such as hand carved, distressed, and/or rustic work.
- Installed solid lumber shall meet the Grades in Section 100-Lumber.
- Installed wood veneers shall meet the Grades in Section 200-Panel Products.
- Other installed products shall meet the material requirements of these standards.

**The entire installation shall present Good Workmanship for the Grade specified. (See the Introduction to the Standards.)**

1700-T-4

Table of Section Installation Standards (Standing and Running Trim)

Section 300 Specific Installation Standards for 8th Ed.	Premium	Custom	Economy
<b>Standing and Running Trim (Section 300) - Up to 3 m [118"] above finished floor</b>			
Exposed end returns profiled or self mitered returned	Required	Required	Not Required
Back prime unfinished trim before installation (must be specified in Contract)	If specified	If specified	If specified
Trim installed in maximum available lengths	Required	Required	Not required
Trim installed plumb, level, and square *	Required	Required	Required
Joints staggered on multi-member trims	Required	Required	Not required
No joint in single running trim closer than . . . from the next one	1220 mm [48"]	914 mm [36"]	609 mm [24"]
Trim selected for grain and color complying with specified Grade of work	Required	Required	Required
Running joints to be diagonal scarf, or butted with dowel, biscuit, or spline tightly fitted, flush, and glued *	Required	Required	Not required
Cope inside corners, moulded trim	Required	Permitted	Not required
Miter inside corners, moulded trim	Not permitted	Permitted	Required
Miter outside angles	Required	Required	Required
Miters over 100 mm [4"] long splined or doweled tightly fitted, flush, and glued *	Required	Not required	Not required
Blind nailing and concealed fastening, includes construction adhesive (a)	Required	Required	Permitted
(a) When exposed fastening is required to complete installation, exposed fasteners to be set in quirks, reveals, and reliefs (to be least visible when installation is complete)	Required	Required	Not required
Exposed wood base scribed (if specified)	Required	Required	Required
Securely fastened with panel adhesive, face nails, or pins (no trim screws)	Required	Required	Permitted
Securely fastened with trim screws	Not permitted	Permitted	Permitted
Drywall, bugle head, or case-hardened screws	Not permitted	Not permitted	Not required
Face fasteners shall be countersunk to permit filling	Required	Required	Required
Exposed or filled fasteners through exposed HPDL surfaces	Not permitted	Not permitted	Not permitted
Caulk to adjacent surface if gap is 1.5 mm [1/16"] or less *	Not permitted	Permitted	Not required
Caulk used to fill gaps and voids (within tolerances) shall be color compatible *	Required	Required	Permitted
Back blocking behind large crowns and similar decorative trims	Required	Required	Permitted
Warped or twisted mouldings which can not be held true	Not permitted	Not permitted	Not permitted
Grounds and hanging systems shall be plumb and true *	Required	Required	Required
Installation shall be inconspicuous, defined in WoodWords glossary	Required	Not required	Not Required
* VARIATION NOTE: Due to deviations in existing buildings and in the absence of clear performance standards for framing and drywall, gaps between standing and running trim at building walls and ceilings shall not be the responsibility of the millwork installer.			

1700-T-5

Table of Section Installation Standards (Architectural Cabinets)

Section 400 Specific Installation Standards for 8th Ed.	Premium	Custom	Economy
<b>Architectural Cabinets and Casework (Section 400) - Up to 3 m [118"] above finished floor</b>			
Base and/or toe kick scribed to uneven floor	If specified	If specified	If specified
Back prime unfinished areas before installation (must be specified in Contract)	If specified	If specified	If specified
Hardware installed neatly with no tear out of surrounding	Required	Required	Not required
Hardware, latches, slides, catches, etc. adjusted for smooth operation	Required	Required	Permitted
Hinges adjusted to bring doors into alignment and within gap tolerances	Required	Required	Permitted
Screws in all hardware shall be installed per manufacturer's instructions.	Required	Required	Permitted
Doors and drawer fronts shall align vertically, horizontally, and in front plane within tolerances set in this standard	Required	Required	Required
Doors and drawers meet gap tolerances, work smoothly	Required	Required	Required
Trim selected for grain and color complying with specified Grade of work	Required	Required	Required
Cutouts for installation of equipment by others, if templates furnished on time	Required	Required	Not required
Exposed surfaces trimmed to wall with overlay trim *	Permitted	Not required	Not required
Exposed surfaces scribed to wall with scribe strip, 0.8mm [1/32"] gap tolerance *	Required	Not required	Not required
End joints of running scribes may be butt joined.	Not permitted	Not permitted	Permitted
End joints of running scribes shall be bevel joined, corners mitered or coped	Required	Required	Permitted
Caulk to adjacent surface if gap is 1.6mm [1/16"] or less *	Not permitted	Permitted	Not required
Wood filler strip to cover a maximum gap of 38mm [1-1/2"] *	Not permitted	Permitted	Not required
Cabinets mounted plumb and square w/ adequate screws	Required	Required	Required
Wall and base cabinets fastened thru back and/or cleat	Required	Required	Permitted
Closed wall and base cabinets installed on wood or metal clips or metal hanging systems	Permitted	Permitted	Permitted
Open cabinets installed by concealed methods	Required	Not required	Not required
Applied covers over screw heads or holes, compatible in color	Not permitted	Permitted	Permitted
Cabinets installed end-to-end with countersunk fasteners	Required	Not required	Not required
Blind nailing and concealed fastening	Permitted	Not required	Not required
Drywall, bugle head, or case-hardened screws	Not permitted	Not permitted	Not permitted
Miter inside corners, moulded trim	Permitted	Permitted	Required
Miter outside angles	Required	Required	Required
Scribe/fillers securely fastened with panel adhesive, face nails, or pins (no trim screws)	Required	Required	Permitted
Scribes/fillers securely fastened with trim screws	Not permitted	Not permitted	Permitted
Exposed fasteners to be set in quirks, reveals (less visible)	Required	Required	Not required
Face fasteners shall be countersunk to permit filling	Required	Required	Required
Caulk used to fill gaps and voids (within tolerances) shall be color compatible *	Required	Required	Permitted
Semi-exposed countersunk fasteners filled/color matched	Required	Required	Not required
Exposed or filled fasteners through exposed HPDL surfaces	Not permitted	Not permitted	Not permitted
Installation shall be inconspicuous, defined in WoodWords glossary	Required	Not required	Not required

\* VARIATION NOTE: Due to deviations in existing buildings and a lack of clear performance standards for framing and drywall, gaps between casework and building walls and ceilings shall not be the responsibility of the millwork installer.

1700-T-6

Table of Section Installation Standards (Architectural Counters and Tops)

Section 400 Specific Installation Standards for 8th Ed.	Premium	Custom	Economy
<b>Architectural Counters and Tops (Section 400) - Up to 3 m [118"] above finished floor</b>			
Back prime unfinished areas before installation (must be specified in contract)	If specified	If specified	If specified
Hardware installed neatly with no tear out of surrounding	Required	Required	Not required
Screws in all hardware shall be installed per manufacturer's instructions.	Required	Required	Not required
Cutouts for installation of equipment by others, if templates furnished on time	Required	Required	Not required
Exposed surfaces trimmed to wall with overlay trim *	Permitted	Not required	Not required
Countertops and splashes securely anchored and scribed to wall, 0.8 mm [1/32"] gap tolerance *	Required	Required	Not required
End joints of running scribes may be butt joined.	Not permitted	Not permitted	Permitted
End joints of running scribes shall be bevel joined, corners mitered or coped	Required	Required	Permitted
Caulk to adjacent surface if gap is 1.6 mm [1/16"] or less *	Not permitted	Permitted	Not required
Wood filler strip to cover a maximum gap of 38 mm [1-1/2"] *	Not permitted	Permitted	Not required
Drywall, bugle head, or case-hardened screws	Not permitted	Not permitted	Not permitted
Blind nailing and concealed fastening	Permitted	Not required	Not required
Covers over screw heads or holes, compatible in color	Not permitted	Permitted	Permitted
Caulk used to fill gaps and voids (within tolerances) shall be color compatible *	Required	Required	Permitted
Semi-exposed countersunk fasteners filled/color matched	Required	Required	Not required
Countertops on base cabinets shall be securely anchored with uniform front overhang *	Required	Required	Not required
Front and/or leading edges of tops to withstand a 75 pound pull up pressure	Required	Required	Not required
Maximum unsupported scribe span shall be 12.7 mm [1/2"] at wall and closed ends	Required	Required	Not required
Loose joints in tops secured with interlocking mechanical fasteners	Required	Required	Not required
Loose joints in tops in which sinks occur also glued, made watertight	Required	Required	Not required
Countertops shall be installed within a tolerance of $\pm 6.4$ mm [1/4"] of design height *	Required	Required	Not required
Countertops shall be installed within 3 mm [1/8"] in 2.4 m [8'] of level and plumb *	Required	Required	Not required
Cut outs for sinks shall be sealed with one coat water resistant sealer	Required	Required	Required
Cut outs for sinks shall have a minimum of 3 mm [1/8"] radius at inside corners	Required	Required	Required
Exposed or filled fasteners through exposed HPDL surfaces	Not permitted	Not permitted	Not permitted
When integral cove back splashes required, square butt joint end splashes furnished	Required	Required	Not required
End splashes butt joined, caulked, and screwed to end of countertop	Required	Not required	Not required
Installation shall be inconspicuous, defined in WoodWords glossary, with the exception of access panel fasteners.	Required	Not required	Not required
Square butt joint splashes shall be caulked to the top with color matched waterproof caulking so as to leave a bead not exceeding 3 mm [1/8"] all grades.			
Maximum cantilever, with or without sub top, from a support is 305 mm [12"] any direction all grades.			
Removable components shall be attached with stainless steel flat head wood screws, set flush, all grades			
Reagent shelves shall be covered on both sides and all edges with the same chemical resistant material and adhesive as tops, all grades.			
* VARIATION NOTE: Due to deviations in existing buildings and a lack of clear performance standards for framing and drywall, gaps between tops and splashes at building walls shall not be the responsibility of the millwork installer.			

1700-T-7

Table of Section Installation Standards (Solid Surfacing Installations)

Section 400 Specific Installation Standards for 8th Ed.	Premium	Custom	Economy
<b>Architectural Solid Surfacing Installation (Section 400) - Up to 3 m [118"] above finished floor</b>			
Exposed surfaces trimmed to wall with overlay trim *	Permitted	Not required	Not required
Exposed surfaces scribed to wall with scribe strip, 0.8 mm [1/32"] gap tolerance *	Required	Not required	Not required
End joints of running scribes may be butt joined.	Permitted	Permitted	Permitted
Caulk to adjacent surface if gap is 1.6 mm [1/16"] or less *	Not permitted	Permitted	Not required
Drywall, bugle head, or case-hardened screws	Not permitted	Not permitted	Not permitted
Blind nailing and concealed fastening	Permitted	Not required	Not required
Caulk used to fill gaps and voids (within tolerances) shall be color compatible *	Required	Required	Permitted
Semi-Exp. countersunk fasteners filled/color matched	Required	Required	Not required
Countertops and splashes scribed to wall and securely anchored	Required	Required	Not required
Countertops on base cabinets shall be securely anchored with uniform front overhang *	Required	Required	Not required
Front and/or leading edges of tops to withstand a 75 pound pull up pressure	Required	Required	Not required
Installation shall be performed by personnel properly trained & certified by the solid surface material manufacturer	Required	Required	Not required
Expansion clearance of 3 mm [1/8"] for every 3 m [118"] in length	Required	Required	Required
Specific manufacturer's sealants and adhesives shall be used	Required	Required	Not required
Countertops shall be installed within a tolerance of ± 6.4 mm [1/4"] of design height *	Required	Required	Not required
Countertops shall be installed within 3 mm [1/8"] in 2.4 m [8'] of level and plumb *	Required	Required	Not required
Cutouts for installation of equipment by others, if templates furnished on time	Required	Required	Required
Cutouts shall be smoothed, top and bottom, all around	Required	Required	Required
Cutouts shall have a minimum of 6 mm [1/4"] radius at inside corners	Required	Required	Required
Cutouts for heat producing units shall be reinforced and protected with reflective tape	Required	Required	Required
Joints shall be made square (butt) rather than mitered and supported by framing	Required	Required	Permitted
Manufacturer's recommended tape or slip sheet shall prevent bond between joint & support	Required	Required	Not required
"L" or "U" shaped assemblies shall have smooth rounded inside corners	Required	Permitted	Permitted
Horizontal members shall have full perimeter and joint support	Required	Required	Required
Unsupported span for non-acrylic materials shall be less than 610 mm [24"]	Required	Required	Not required
Maximum unsupported and unloaded overhang shall be 305 mm [12"] for 19 mm ...	Required	Required	Required
... and 152 mm [6"] for 12.7 mm [1/2"] solid surface sheets	Required	Required	Required
Installation shall be inconspicuous, defined in WoodWords glossary	Required	Not required	Not required
* VARIATION NOTE: Due to deviations in existing buildings and a lack of clear performance standards for framing and drywall, gaps between solid surface and building walls and ceilings shall not be the responsibility of the millwork installer.			

1700-T-8

Table of Section Installation Standards (Paneling)

Section 500 Specific Installation Standards for 8th Ed.	Premium	Custom	Economy
<b>Architectural Paneling (Section 500) - Up to 3 m [118"] above finished floor</b>			
Backs of wood paneling shall be sealed with at least two coats of sealer.	Required	Permitted	Permitted
Edges of core that are not self-edged shall have one coat sealer applied before installation.	Required	Permitted	Permitted
Hardware installed neatly with no tear out of surrounding	Required	Required	Not required
Trim selected for grain and color complying with specified Grade of work	Required	Required	Required
Cut outs for installation of equipment by others, if templates furnished on time	Required	Required	Not required
Exposed surfaces trimmed to wall with overlay trim *	Permitted	Not required	Not required
Exposed surfaces scribed to wall with scribe strip, 0.8 mm [1/32"] gap tolerance *	Required	Not required	Not required
End joints of running scribes may be butt joined.	Not permitted	Not required	Permitted
End joints of running scribes shall be bevel joined, corners mitered or coped	Required	Required	Permitted
Caulk to adjacent surface if gap is 1.5 mm [1/16"] or less *	Not permitted	Permitted	Not required
Wood filler strip to cover a maximum gap of 38 mm [1-1/2"] *	Not permitted	Permitted	Not required
Drywall, bugle head, or case-hardened screws	Not permitted	Not required	Not permitted
Blind nailing and concealed fastening, includes construction adhesive (a)	Required	Required	Permitted
(a) When exposed fastening is required to complete installation, exposed fasteners to be set in quirks, reveals, and reliefs (to be least visible when installation is complete)	Required	Required	Not required
Face fasteners shall be countersunk to permit filling	Required	Required	Required
Semi-exposed countersunk fasteners filled/color matched	Required	Required	Not required
Exposed or filled fasteners through exposed HPDL surfaces	Not permitted	Not required	Not permitted
Miter inside corners, moulded trim	Not permitted	Permitted	Required
Miter outside angles	Required	Required	Required
Scribe/fillers securely fastened with panel adhesive, face nails, or pins (no trim screws)	Required	Required	Permitted
Scribes/fillers securely fastened with trim screws	Not permitted	Not required	Permitted
Caulk used to fill gaps and voids (within tolerances) shall be color compatible *	Required	Required	Permitted
Paneling joints shall be smooth and flush to create a homogenous look.	Required	Required	Permitted
Panel joints shall be plumb within 1.5 mm in 2440 mm [1/16" in 96"].	Required	Required	Permitted
Reveal strips that are grooved into paneling are to be left floating and allowed to expand and contract in reaction to changing relative humidity.	Required	Required	Required
Expansion joints shall be provided equivalent to 1.5 mm [1/16"] per four lineal feet of elevation.	Required	Required	Required
Paneling shall be installed flat to a tolerance of: *	0.8mm [1/32"] per lineal foot	1.2 mm [3/64"] per lineal foot	1.5 mm [1/16"] per lineal foot
Grounds and hanging systems shall be plumb and true *	Required	Required	Required
Required expansion clearance is at least 3 mm for every 3048 mm [1/8" for every 120"] in length. Joints designed to be caulked shall be minimum of 3 mm [1/8 "] wide to allow satisfactory caulking penetration and expansion.	Required	Required	Required
Installation shall be inconspicuous, defined in WoodWords glossary	Required	Not required	Not required
* VARIATION NOTE: Due to deviations in existing buildings and a lack of clear performance standards for framing and drywall, gaps and tolerances between panels and building walls and ceilings shall not be the responsibility of the millwork installer.			

1700-T-9

Table of Section Installation Standards (Closet and Utility Shelving)

Section 600 Specific Installation Standards for 8th Ed.	Premium	Custom	Economy
<b>Architectural Closet and Utility Shelving (Section 600) - Up to 3 m [118"] above finished floor</b>			
Back prime unfinished areas before installation (must be specified in contract)	If specified	If specified	If specified
Hardware installed neatly with no tear out of surrounding stock	Required	Required	Not required
Hardware, latches, slides, catches, etc. adjusted for smooth operation	Required	Required	Not required
Screws in all hardware shall be installed per manufacturer's instructions	Required	Required	Not required
Trim selected for grain and color complying with specified Grade of work	Required	Required	Required
Cutouts for installation of equipment by others, if templates furnished on time	Required	Required	Not required
Exposed surfaces trimmed to wall with overlay trim *	Permitted	Not required	Not required
Exposed surfaces scribed to wall with scribe strip, 0.8 mm [1/32"] gap tolerance *	Required	Not required	Not required
End joints of running scribes may be butt joined.	Not permitted	Not permitted	Permitted
End joints of running scribes shall be bevel joined, corners mitered or coped	Required	Required	Permitted
Caulk to adjacent surface if gap is 1.6 mm [1/16"] or less *	Not permitted	Permitted	Not required
Wood filler strip to cover a maximum gap of 38 mm [1-1/2"] *	Not permitted	Permitted	Not required
Shelving mounted plumb and square with adequate screws	Required	Required	Required
Drywall, bugle head, or case-hardened screws	Not permitted	Not permitted	Not permitted
Blind nailing and concealed fastening	Permitted	Not required	Not required
Covers over screw heads or holes, compatible in color	Not permitted	Permitted	Permitted
Miter inside corners, moulded trim	Not permitted	Permitted	Required
Miter outside angles	Required	Required	Required
Scribe/fillers securely fastened with panel adhesive, face nails, or pins (no trim screws)	Required	Required	Permitted
Scribes/fillers securely fastened with trim screws	Not permitted	Not permitted	Permitted
Exposed fasteners to be set in quirks, reveals, and reliefs (less visible)	Required	Required	Not required
Face fasteners shall be countersunk to permit filling	Required	Required	Required
Caulk used to fill gaps and voids (within tolerances) shall be color compatible *	Required	Required	Permitted
Semi-exposed countersunk fasteners filled/color matched	Required	Required	Not required
Exposed or filled fasteners through exposed HPDL surfaces	Not permitted	Not permitted	Not permitted
Installation shall be inconspicuous, defined in WoodWords glossary	Required	Not required	Not required
* VARIATION NOTE: Due to deviations in existing buildings and a lack of clear performance standards for framing and drywall, gaps between shelving elements and building walls and ceilings shall not be the responsibility of the millwork installer.			

**1700-T-10**

**Table of Section Installation Standards (Ornamental)**

<b>Section 700 Specific Installation Standards for 8th Ed.</b>	<b>Premium</b>	<b>Custom</b>	<b>Economy</b>
<b>Ornamental Work (Section 700) - Up to 3 m [118"] above finished floor</b>			
Exposed end returns profiled or self mitered returned	Required	Required	Not required
Back prime unfinished assemblies before installation (must be specified in contract)	If specified	If specified	If specified
Trim installed in maximum available lengths	Required	Required	Not required
Trim installed plumb, level, and square *	Required	Required	Required
Joints staggered on multi-member trims	Required	Required	Not required
Trim selected for grain and color complying with specified Grade of work	Required	Required	Required
Running joints to be diagonal scarf or butted with dowel, biscuit, or spline tightly fitted, flush, and glued *	Required	Required	Not required
Exposed surfaces scribed to wall with scribe strip, 0.8 mm [1/32"] gap tolerance *	Required	Not required	Not required
End joints of running scribes shall be bevel joined, corners mitered or coped	Required	Required	Permitted
Caulk to adjacent surface if gap is 1.5 mm [1/16"] or less *	Not permitted	Permitted	Not required
Wood filler strip to cover a maximum gap of 38 mm [1-1/2"] *	Not permitted	Permitted	Not required
Drywall, bugle head, or case-hardened screws	Not permitted	Not permitted	Not required
Blind nailing and concealed fastening, includes Construction adhesive (a)	Required	Required	Permitted
(a) When exposed fastening is required to complete installation, exposed fasteners to be set in quirks, reveals, and reliefs (to be least visible when installation is complete)	Required	Required	Not required
Face fasteners shall be countersunk to permit filling	Required	Required	Required
Semi-exposed countersunk fasteners filled/color matched	Required	Required	Not required
Exposed or filled fasteners through exposed HPDL surfaces	Not permitted	Not permitted	Not permitted
Miter inside corners, moulded trim	Not permitted	Permitted	Required
Miter outside angles	Required	Required	Required
Miters over 100 mm [4"] long splined or doweled tightly fitted, flush, and glued *	Required	Not required	Not required
Scribe/fillers securely fastened with panel adhesive, face nails, or pins (no trim screws)	Required	Required	Permitted
Scribes/fillers securely fastened with trim screws	Not permitted	Not permitted	Permitted
Caulk used to fill gaps and voids (within tolerances) shall be color compatible *	Required	Required	Permitted
Back blocking behind large crowns and similar trims	Required	Required	Permitted
Warped or twisted mouldings which can not be held true	Not permitted	Not permitted	Not permitted
Grounds and hanging systems shall be plumb and true *	Required	Required	Required
Required expansion clearance is at least 3mm for every 3048mm [1/8" for every 120"] in length. Joints to be caulked shall be approximately 3 mm [1/8 "] wide to allow satisfactory caulking penetration and expansion.	Required	Required	Required
Installation shall be inconspicuous, defined in WoodWords glossary	Required	Not required	Not required
* VARIATION NOTE: Due to deviations in existing buildings and a lack of clear performance standards for framing and drywall, gaps and tolerances between ornamental work and building walls and ceilings shall not be the responsibility of the millwork installer.			

1700-T-11

Table of Section Installation Standards (Stairwork)

Section 800 Specific Installation Standards for 8th Ed.	Premium	Custom	Economy
<b>Stairwork &amp; Rails (Section 800) - Up to 3 m [118"] above finished floor</b>			
Exposed end returns profiled or self mitered returned	Required	Required	Not required
Back prime concealed surfaces before installation (must be specified in contract)	If specified	If specified	If specified
Hardware installed neatly with no tear out of surrounding	Required	Required	Not required
Elements installed in maximum available lengths	Required	Required	Not required
Elements installed plumb, level, and square *	Required	Required	Required
Joints staggered on multi-member assemblies	Required	Required	Not required
Adjacent elements selected for grain and color complying with specified Grade of work	Required	Required	Required
Running joints to be diagonal scarf or butted with dowel, biscuit, or spline tightly fitted, flush, and glued *	Required	Required	Not required
Cope inside corners, moulded trim	Required	Permitted	Not required
Miter inside corners, moulded trim	Not permitted	Permitted	Required
Miter outside angles	Required	Required	Required
Miters over 100 mm [4"] long splined or doweled tightly fitted, flush, and glued *	Required	Not required	Not required
Blind nailing and concealed fastening, includes Construction adhesive (a)	Required	Required	Permitted
(a) When exposed fastening is required to complete installation, exposed fasteners to be set in quirks, reveals, and reliefs (to be least visible when installation is complete)	Required	Required	Not required
Exposed surfaces trimmed to wall with overlay trim *	Permitted	Not required	Not required
Exposed surfaces scribed to wall with scribe strip, 0.8 mm [1/32"] gap tolerance *	Required	Not required	Not required
Caulk to adjacent surface if gap is 1.5 mm [1/16"] or less *	Not permitted	Permitted	Not required
Caulk used to fill gaps and voids (within tolerances) shall be color compatible *	Required	Required	Permitted
Wood filler strip to cover a maximum gap of 38 mm [1-1/2"] *	Not permitted	Permitted	Not required
Drywall, bugle head, or case-hardened screws	Not permitted	Not permitted	Not permitted
Face fasteners shall be countersunk to permit filling	Required	Required	Required
Scribe/fillers securely fastened with panel adhesive, face nails, or pins (no trim screws)	Required	Required	Permitted
Scribes/fillers securely fastened with trim screws	Not permitted	Not permitted	Permitted
Warped or twisted mouldings which can not be held true	Not permitted	Not permitted	Not permitted
Treads and landings shall be installed flat to a tolerance of: *	0.8mm [1/32"] per lineal foot	1.2 mm [3/64"] per lineal foot	1.5 mm [1/16"] per lineal foot
Grounds and hanging systems shall be plumb and true *	Required	Required	Required
Installation shall be inconspicuous, defined in WoodWords glossary	Required	Not required	Not required
* VARIATION NOTE: Due to deviations in existing buildings and a lack of clear performance standards for framing and drywall, gaps and tolerances between stairwork and building walls and ceilings shall not be the responsibility of the millwork installer.			

1700-T-12

Table of Section Installation Standards (Frame)

Section 900 Specific Installation Standards for 8th Ed.	Premium	Custom	Economy
<b>Frames &amp; Jambs (Section 900) - Up to 3 m [118"] above finished floor</b>			
Rough wood bucks secured at openings	Required	Required	Required
Exposed end returns profiled or self mitered returned	Required	Required	Not required
Back prime unfinished members before installation (must be specified in contract)	If specified	If specified	If specified
Members installed in maximum available lengths	Required	Required	Not required
Members installed plumb, level, within 3 mm [1/8"] in 2440 mm [96"] *	Required	Required	Required
Frame legs shall be set square with header and parallel to each other within: *	1.5 mm [1/16"]	3 mm [1/8"]	5 mm [3/16"]
Joints staggered on multi-member assemblies	Required	Required	Not required
Members selected for grain and color complying with specified Grade of work	Required	Required	Required
Running joints to be diagonal scarf or butted with dowel, biscuit, or spline tightly fitted, flush, and glued *	Required	Required	Not Required
Cope inside corners, moulded trim	Required	Permitted	Not required
Miter inside corners, moulded trim	Not permitted	Permitted	Required
Miter outside angles	Required	Required	Required
Miters over 100 mm [4"] long splined or doweled tightly fitted, flush, and glued *	Required	Not required	Not required
Blind nailing and concealed fastening, includes Construction adhesive (a)	Required	Permitted	Not required
(a) When exposed fastening is required to complete installation, exposed fasteners to be set in quirks, reveals, and reliefs (to be least visible when installation is complete)	Required	Required	Not required
Securely fastened with panel adhesive, face nails, or pins (no trim screws)	Required	Required	Permitted
Securely fastened with trim screws	Not permitted	Permitted	Permitted
Drywall, bugle head, or case-hardened screws	Not permitted	Not permitted	Not permitted
Face fasteners shall be countersunk to permit filling	Required	Required	Required
Exposed or filled fasteners through exposed HPDL surfaces	Not permitted	Not permitted	Not permitted
Caulk to adjacent surface if gap is 1.5 mm [1/16"] or less *	Required	Permitted	Not required
Caulk used to fill gaps and voids (within tolerances) shall be color compatible *	Required	Required	Permitted
Back blocking behind large elements and assemblies	Required	Required	Permitted
Warped or twisted mouldings which can not be held true	Not permitted	Not permitted	Not permitted
Grounds and hanging systems shall be plumb and true *	Required	Required	Required
Installation shall be inconspicuous, defined in WoodWords glossary	Required	Not required	Not required
* VARIATION NOTE: Due to deviations in existing buildings and in the absence of clear performance standards for framing and drywall, gaps between standing and running trim at building walls and ceilings shall not be the responsibility of the millwork installer.			

1700-T-13

Table of Section Installation Standards (Windows)

Section 1000 Specific Installation Standards for 8th Ed.	Premium	Custom	Economy
<b>Windows (Section 1000) - Up to 3 m [118"] above finished floor</b>			
Rough wood bucks secured at openings	Required	Required	Required
Exposed end returns profiled or self mitered returned	Required	Required	Not required
Back prime unfinished members before installation (must be specified in contract)	If specified	If specified	If specified
Members installed in maximum available lengths	Required	Required	Not required
Members installed plumb, level, within 3 mm [1/8"] in 2440 mm [96"] *	Required	Required	Required
Frame legs shall be set square with header and parallel to each other within: *	1.5 mm [1/16"]	3 mm [1/8"]	5 mm [3/16"]
Joints staggered on multi-member assemblies	Required	Required	Not required
Members selected for grain and color complying with specified Grade of work	Required	Required	Required
Running joints to be diagonal scarf or butted with dowel, biscuit, or spline tightly fitted, flush, and glued *	Required	Required	Not required
Cope inside corners, moulded trim	Required	Permitted	Not required
Miter inside corners, moulded trim	Not permitted	Permitted	Required
Miter outside angles	Required	Required	Required
Miters over 100 mm [4"] long splined or doweled tightly fitted, flush, and glued *	Required	Not required	Not required
Blind nailing and concealed fastening, includes Construction adhesive (a)	Required	Permitted	Not required
(a) When exposed fastening is required to complete installation, exposed fasteners to be set in quirks, reveals, and reliefs (to be least visible when installation is complete)	Required	Required	Not required
Securely fastened with panel adhesive, face nails, or pins (no trim screws)	Required	Required	Permitted
Securely fastened with trim screws	Not permitted	Permitted	Permitted
Drywall, bugle head, or case-hardened screws	Not permitted	Not permitted	Not permitted
Face fasteners shall be countersunk to permit filling	Required	Required	Required
Exposed or filled fasteners through exposed HPDL surfaces	Not permitted	Not permitted	Not permitted
Caulk to adjacent surface if gap is 1.5 mm [1/16"] or less *	Required	Permitted	Not required
Caulk used to fill gaps and voids (within tolerances) shall be color compatible *	Required	Required	Permitted
Back blocking behind large elements and assemblies	Required	Required	Permitted
Warped or twisted mouldings which can not be held true	Not permitted	Not permitted	Not permitted
Grounds and hanging systems shall be plumb and true *	Required	Required	Required
Installation shall be inconspicuous, defined in WoodWords glossary	Required	Not required	Not required
* VARIATION NOTE: Due to deviations in existing buildings and in the absence of clear performance standards for framing and drywall, gaps between standing and running trim at building walls and ceilings shall not be the responsibility of the millwork installer.			

**1700-T-14**

**Table of Section Installation Standards (Screens)**

<b>Section 1100 Specific Installation Standards for 8th Ed.</b>	<b>Premium</b>	<b>Custom</b>	<b>Economy</b>
<b>Screens (Section 1100) - Up to 3 m [118"] above finished floor</b>			
Back prime unfinished members before installation (must be specified in contract)	If specified	If specified	If specified
Members installed plumb, level, within 3 mm [1/8"] in 2440 mm [96"] *	Required	Required	Required
Frame legs shall be set square with header and parallel to each other within: *	1.5 mm [1/16"]	3 mm [1/8"]	5 mm [3/16"]
Joints staggered on multi-member assemblies	Required	Required	Not required
Members selected for grain and color complying with specified Grade of work	Required	Required	Required
Running joints to be diagonal scarf or butted with dowel, biscuit, or spline tightly fitted, flush, and glued *	Required	Required	Not required
Miter outside angles	Required	Required	Required
Miters over 100 mm [4"] long splined or doweled tightly fitted, flush, and glued *	Required	Not required	Not required
Drywall, bugle head, or case-hardened screws	Not permitted	Not permitted	Not permitted
Face fasteners shall be countersunk to permit filling	Required	Required	Required
Warped or twisted mouldings which can not be held true	Not permitted	Not permitted	Not permitted
Grounds and hanging systems shall be plumb and true *	Required	Required	Required
Installation shall be inconspicuous, defined in WoodWords glossary	Required	Not required	Not required
* VARIATION NOTE: Due to deviations in existing buildings and in the absence of clear performance standards for framing and drywall, gaps between standing and running trim at building walls and ceilings shall not be the responsibility of the millwork installer.			

**1700-T-15**

**Table of Section Installation Standards (Blinds & Shutters)**

<b>Section 1200 Specific Installation Standards for 8th Ed.</b>	<b>Premium</b>	<b>Custom</b>	<b>Economy</b>
<b>Blinds &amp; Shutters (Section 1200) - Up to 3 m [118"] above finished floor</b>			
Back prime unfinished members before installation (must be specified in contract)	If specified	If specified	If specified
Members installed plumb, level, within 3 mm [1/8"] in 2440 mm [96"] *	Required	Required	Required
Frame legs shall be set square with header and parallel to each other within: *	1.5 mm [1/16"]	3 mm [1/8"]	5 mm [3/16"]
Joints staggered on multi-member assemblies	Required	Required	Not required
Members selected for grain and color complying with specified Grade of work	Required	Required	Required
Running joints to be diagonal scarf or butted with dowel, biscuit, or spline tightly fitted, flush, and glued *	Required	Required	Not required
Miter outside angles	Required	Required	Required
Miters over 100 mm [4"] long splined or doweled tightly fitted, flush, and glued *	Required	Not required	Not required
Drywall, bugle head, or case-hardened screws	Not permitted	Not permitted	Not permitted
Face fasteners shall be countersunk to permit filling	Required	Required	Required
Warped or twisted mouldings which can not be held true	Not permitted	Not permitted	Not permitted
Grounds and hanging systems shall be plumb and true *	Required	Required	Required
Installation shall be inconspicuous, defined in WoodWords glossary	Required	Not required	Not required
* VARIATION NOTE: Due to deviations in existing buildings and in the absence of clear performance standards for framing and drywall, gaps between standing and running trim at building walls and ceilings shall not be the responsibility of the millwork installer.			

1700-T-16

Table of Section Installation Standards (Architectural Flush Doors)

Section 1300 Specific Installation Standards for 8th Ed.	Premium	Custom	Economy
<b>Flush Doors (Section 1300) - Up to 3 m [118"] above finished floor</b>			
Members installed plumb, level, within 3 mm [1/8"] in 2440 mm [96"] *	Required	Required	Required
Frame legs shall be set square with header and parallel to each other within: *	1.5 mm [1/16"]	3 mm [1/8"]	5 mm [3/16"]
Door installer shall proceed only when furnished with approved hardware schedule, required templates, and approved frame shop drawings showing exact locations for hardware preparation relative to frames.	Required	Required	Required
Fitting for width, trim equally from both sides *	Required	Required	Permitted
Fitting for height, trim more than 19 mm [3/4"] *	Not permitted	Not permitted	Permitted
Veneer or laminate protected from chipout during fitting	Required	Required	Required
Threaded-to-the-head wood screws	Required	Required	Permitted
Pilot holes for wood screws	Required	Required	Required
Labels shall not be removed from rated doors	Required	Required	Required
Machining of rated doors under Label Service	Required	Required	Required
Prime and/or seal and finish all six surfaces of doors within 72 hours of delivery to the job site	Required	Required	Required
Seal and finish all field cuts immediately	Required	Required	Required
Fitting, hardware, lights, louvers, plant-ons, or other details shall not impair the utility or structural soundness of door	Required	Required	Required
Light/louver cutouts protected from exterior water entry	Required	Required	Required
All screws applied to all pieces of hardware	Required	Required	Required
Maximum space between jamb and edge of door (a)	4 mm [1/8"]	4 mm [1/8"]	5 mm [3/16"]
Maximum space between header and top edge of door (a)	4 mm [1/8"]	4 mm [1/8"]	5 mm [3/16"]
Maximum space between meeting edges of pairs or sets (a)	4 mm [1/8"]	4 mm [1/8"]	5 mm [3/16"]
Maximum extension of face of door beyond jamb (a)	2 mm [1/16"]	4 mm [1/8"]	5 mm [3/16"]
Maximum set-back of face of door behind jamb (a)	4 mm [1/8"]	5 mm [3/16"]	6 mm [1/4"]
Maximum clearance between bottom and finished floor (a)	19 mm [3/4"] or as specified		
(a) Door installer is not responsible for spaces in excess of these dimensions if the door supplier has pre-fit or pre-machined in error and/or the design aesthetic or hardware selected requires larger clearances. *			
Thickness of door hung on offset pivots, intermediate required	up to 57 mm	up to 57 mm	up to 57 mm
Thickness of door hung on offset pivots, intermediate not required	57 mm [2-1/4"]	57 mm [2-1/4"]	57 mm [2-1/4"]
Doors within Blueprint Matched Paneling installed by:	Panel installer	Panel installer	No requirement
Hinges: Two up to 1524 mm [60"]; three up to 2286 mm [90"]; one more for every 762 mm [30"] or portion thereof.	Required	Required	Required
Members selected for grain and color complying with specified Grade of work	Required	Required	Required
Drywall, bugle head, or case-hardened screws	Not permitted	Not permitted	Not permitted
Back blocking behind large elements and assemblies	Required	Required	Permitted
Warped or twisted mouldings which can not be held true	Not permitted	Not permitted	Not permitted
Grounds and hanging systems shall be plumb and true *	Required	Required	Required
Installation shall be inconspicuous, defined in WoodWords glossary	Required	Not required	Not required
* VARIATION NOTE: Due to deviations in existing buildings and in the absence of clear performance standards for framing and drywall, gaps between standing and running trim at building walls and ceilings shall not be the responsibility of the millwork installer.			

1700-T-17

Table of Section Installation Standards (Stile and Rail Doors)

Section 1400 Specific Installation Standards for 8th Ed.	Premium	Custom	Economy
<b>Stile &amp; Rail Doors (Section 1400) - Up to 3 m [118"] above finished floor</b>			
Members installed plumb, level, within 3 mm [1/8"] in 2440 mm [96"] *	Required	Required	Required
Frame legs shall be set square with header and parallel to each other within: *	1.5 mm [1/16"]	3 mm [1/8"]	5 mm [3/16"]
Door installer shall proceed only when furnished with approved hardware schedule, required templates, and approved frame shop drawings showing exact locations for hardware preparation relative to frames.	Required	Required	Required
Fitting for width, trim equally from both sides *	Required	Required	Permitted
Fitting for height, trim more than 19 mm [3/4"] *	Not permitted	Not permitted	Permitted
Veneer or laminate protected from chipout during fitting	Required	Required	Required
Threaded-to-the-head wood screws	Required	Required	Permitted
Pilot holes for wood screws	Required	Required	Required
Labels shall not be removed from rated doors	Required	Required	Required
Machining of rated doors under Label Service	Required	Required	Required
Prime and/or seal and finish all six surfaces of doors within 72 hours of delivery to the job site	Required	Required	Required
Seal and finish all field cuts immediately	Required	Required	Required
Fitting, hardware, lights, louvers, plant-ons, or other details shall not impair the utility or structural soundness of door	Required	Required	Required
Light/louver cutouts protected from exterior water entry	Required	Required	Required
All screws applied to all pieces of hardware	Required	Required	Required
Maximum space between jamb and edge of door (a)	4 mm [1/8"]	4 mm [1/8"]	5 mm [3/16"]
Maximum space between header and top edge of door (a)	4 mm [1/8"]	4 mm [1/8"]	5 mm [3/16"]
Maximum space between meeting edges of pairs or sets (a)	4 mm [1/8"]	4 mm [1/8"]	5 mm [3/16"]
Maximum extension of face of door beyond jamb (a)	2 mm [1/16"]	4 mm [1/8"]	5 mm [3/16"]
Maximum set-back of face of door behind jamb (a)	4 mm [1/8"]	5 mm [3/16"]	6 mm [1/4"]
Maximum clearance between bottom and finished floor (a)	19 mm [3/4"] or as specified		
(a) Door installer is not responsible for spaces in excess of these dimensions if the door supplier has pre-fit or pre-machined in error and/or the design aesthetic or hardware selected requires larger clearances. *			
Thickness of door hung on offset pivots, intermediate required	up to 57 mm	up to 57 mm	up to 57 mm
Thickness of door hung on offset pivots, intermediate not required	57 mm [2-1/4"]	57 mm [2-1/4"]	57 mm [2-1/4"]
Doors within Blueprint Matched Paneling installed by:	Panel installer	Panel installer	No requirement
Hinges: Two up to 1524 mm [60"]; three up to 2286 mm [90"]; one more for every 762 mm [30"] or portion thereof.	Required	Required	Required
Members selected for grain and color complying with specified Grade of work	Required	Required	Required
Drywall, bugle head, or case-hardened screws	Not permitted	Not permitted	Not permitted
Back blocking behind large elements and assemblies	Required	Required	Permitted
Warped or twisted mouldings which can not be held true	Not permitted	Not permitted	Not permitted
Grounds and hanging systems shall be plumb and true *	Required	Required	Required
Installation shall be inconspicuous, defined in WoodWords glossary	Required	Not required	Not required
* VARIATION NOTE: Due to deviations in existing buildings and in the absence of clear performance standards for framing and drywall, gaps between standing and running trim at building walls and ceilings shall not be the responsibility of the millwork installer.			

1700-T-18

Table of Section Installation Standards (Modular Cabinets)

Section 1600 Specific Installation Standards for 8th Ed.	Premium	Custom	Economy
<b>Modular Cabinets (Section 1600) - Up to 3 m [118"] above finished floor</b>			
Base and/or toe kick scribed to uneven floor	If specified	If specified	If specified
Back prime unfinished areas before installation (must be specified in contract)	If specified	If specified	If specified
Hardware installed neatly with no tear out of surrounding	Required	Required	Not required
Hardware, latches, slides, catches, etc., adjusted for smooth operation	Required	Required	Permitted
Hinges adjusted to bring doors into alignment and within gap tolerances	Required	Required	Permitted
Screws in all hardware shall be installed per manufacturer's instructions	Required	Required	Permitted
Doors and drawer fronts shall align vertically, horizontally, and in front plane within tolerances set in this standard	Required	Required	Required
Doors and drawers meet gap tolerances, work smoothly	Required	Required	Required
Trim selected for grain and color complying with specified Grade of work	Required	Required	Required
Cut outs for installation of equipment by others, if templates furnished on time	Required	Required	Not required
Exposed surfaces trimmed to wall with overlay trim *	Permitted	Not required	Not required
Exposed surfaces scribed to wall with scribe strip, 0.8 mm [1/32"] gap tolerance *	Required	Not required	Not required
End joints of running scribes may be butt joined.	Not permitted	Not permitted	Permitted
End joints of running scribes shall be bevel joined, corners mitered or coped	Required	Required	Permitted
Caulk to adjacent surface if gap is 1.6 mm [1/16"] or less *	Not permitted	Permitted	Not required
Wood filler strip to cover a maximum gap of 38 mm [1-1/2"] *	Not permitted	Permitted	Not required
Cabinets mounted plumb and square w/ adequate screws	Required	Required	Required
Wall & Base cabinets fastened thru back and/or cleat	Required	Required	Permitted
Closed Wall and/or Base cabinets installed on wood or metal clips	Permitted	Permitted	Permitted
Open cabinets installed by concealed methods	Required	Not required	Not required
Applied covers over screw heads or holes, compatible in color	Not permitted	Permitted	Permitted
Cabinets installed end-to-end with countersunk fasteners	Required	Not required	Not required
Blind nailing and concealed fastening	Permitted	Not required	Not required
Drywall, bugle head, or case-hardened screws	Not permitted	Not permitted	Not permitted
Miter inside corners, moulded trim	Permitted	Permitted	Required
Miter outside angles	Required	Required	Required
Scribe/fillers securely fastened with panel adhesive, face nails, or pins (no trim screws)	Required	Required	Permitted
Scribes/fillers securely fastened with trim screws	Not permitted	Not permitted	Permitted
Exposed fasteners to be set in quirks, reveals, etc., (less visible)	Required	Required	Not required
Face fasteners shall be countersunk to permit filling	Required	Required	Required
Caulk used to fill gaps and voids (within tolerances) shall be color compatible *	Required	Required	Permitted
Semi-exposed countersunk fasteners filled/color matched	Required	Required	Not required
Exposed or filled fasteners through exposed HPDL surfaces	Not permitted	Not permitted	Not permitted
Installation shall be inconspicuous, defined in WoodWords glossary	Required	Not required	Not required

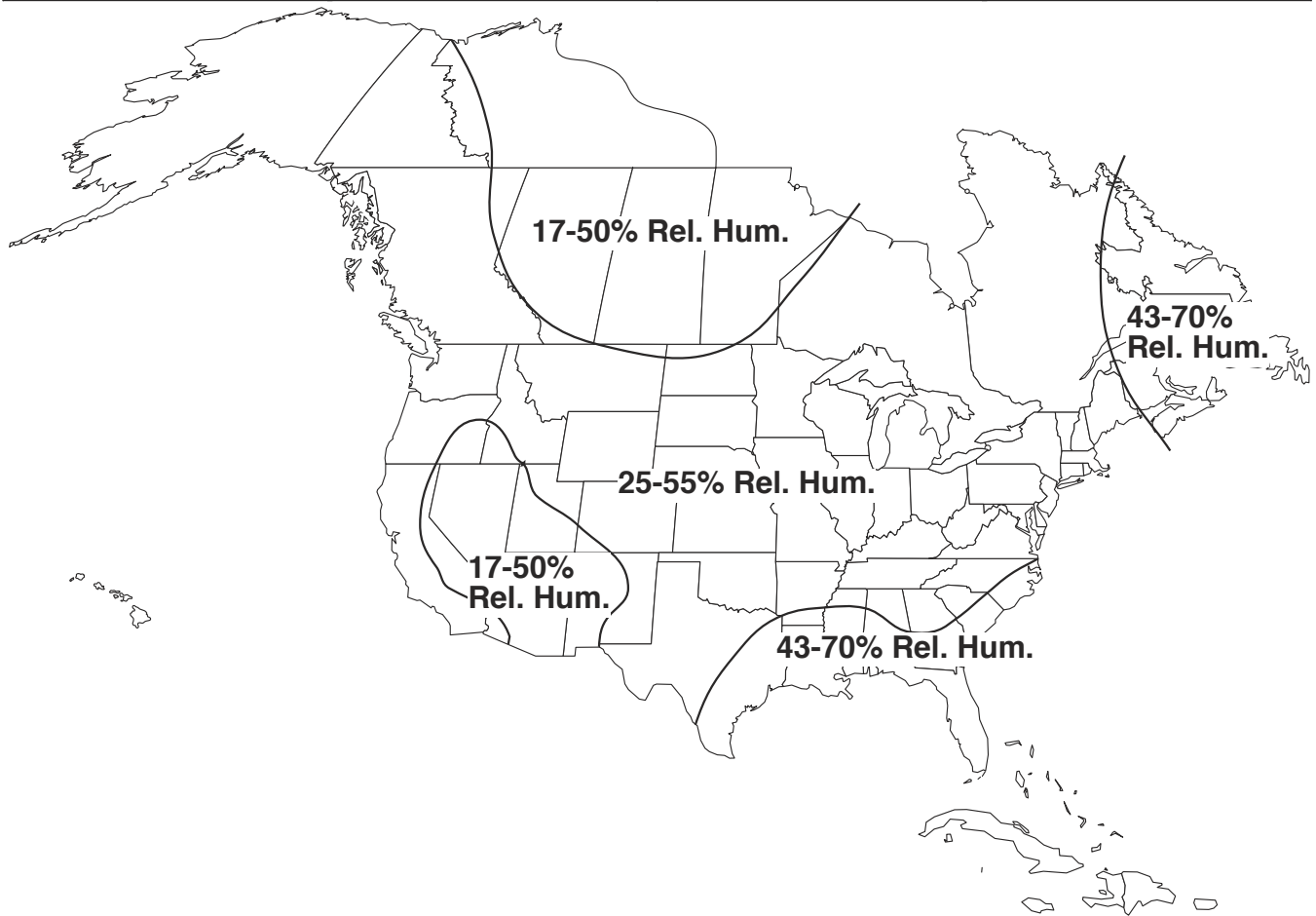
\* VARIATION NOTE: Due to deviations in existing buildings and a lack of clear performance standards for framing and drywall, gaps between casework and building walls and ceilings shall not be the responsibility of the millwork installer.

1700-T-19

**Relative Humidity and Moisture Content**

It is the responsibility of the design professional to engineer the space in which fine woodwork (not to mention laminates, fabrics, and wall coverings) is to be installed with humidity controls required to maintain the optimum relative humidity as shown on the attached charts and tables. The following map shows the approximate average moisture content for interior use of finished woodwork recommended for general areas of the United States and Canada.

Geographical Location	Interior Use		Exterior Use
	Optimum Moisture Content (MC) of Wood	Indoor rel. humidity required to hold optimum MC	
Most of the U.S., Ontario and Quebec in Canada	5-10%	25-55%	9-15%
Damp Southern Coastal areas of the U.S., Newfoundland and Canadian Coastal Provinces	8-13%	43-70%	10-15%
Dry Southwestern U.S.	4-9%	17-50%	7-12%
Alberta, Saskatchewan, Manitoba in Canada	4-9%	17-50%	10-15%



[USDA Forest Service, Agriculture Handbook No. 72]

		Wet bulb lowering in degrees Fahrenheit																													
		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29		
Dry bulb temperature in degrees Fahrenheit	40	83 17.6	75 14.8	68 12.9	60 11.2	52 9.9	45 8.6	37 7.4	29 6.2	22 5.0	15 3.5	8 1.9																			
	45	85 18.3	78 15.6	72 13.7	64 12.0	56 10.7	49 9.5	41 8.5	34 7.5	27 6.5	20 5.3	13 4.2	6 2.9																		
	50	86 19.0	80 16.3	74 14.4	68 12.7	62 11.5	56 10.3	50 9.4	44 8.5	38 7.6	32 6.7	26 5.7	20 4.8	14 3.9	8 2.8	2 1.5															
	55	88 19.5	82 16.9	76 15.1	70 13.4	65 12.2	60 11.0	54 10.1	49 9.3	44 8.4	39 7.6	34 6.8	28 6.0	22 5.3	16 4.5	10 3.6	4 2.5														
	60	89 19.9	83 17.4	78 15.6	73 13.9	68 12.7	63 11.6	58 10.7	53 9.9	48 9.1	43 8.3	39 7.6	34 6.9	28 6.3	22 5.6	16 4.9	10 4.1	4 3.2													
	65	90 20.3	84 17.8	80 16.1	75 14.4	70 13.3	66 12.1	61 11.2	56 10.4	51 9.7	46 8.9	41 8.3	36 7.7	30 7.1	24 6.5	18 5.8	12 5.2	6 4.5													
	70	91 20.9	86 18.2	81 16.5	77 14.9	72 13.7	68 12.5	64 11.6	59 10.9	55 10.1	51 9.4	47 8.8	43 8.3	39 7.7	34 7.2	28 6.6	22 6.0	16 5.5	10 4.7	4 3.7											
	75	91 21.0	86 18.5	82 16.8	78 15.2	74 14.0	70 12.9	66 12.0	62 11.2	58 10.5	54 9.8	51 9.3	47 8.7	43 8.2	39 7.7	34 7.2	28 6.7	22 6.2	16 5.6	10 4.7	4 3.7										
	80	92 21.2	87 18.7	83 17.0	79 15.5	75 14.3	72 13.2	68 12.3	64 11.5	61 10.9	57 10.1	54 9.7	50 9.1	47 8.6	44 8.1	41 7.7	38 7.2	35 6.8	32 6.3	29 5.8	26 5.4	23 5.0	20 4.5	18 4.0	15 3.5	12 3.0	10 2.4	7 1.8	5 1.1		
	85	92 21.3	88 18.8	84 17.2	80 15.7	76 14.5	73 13.5	70 12.5	66 11.8	63 11.2	59 10.5	56 10.0	53 9.5	50 9.0	47 8.5	44 8.1	41 7.6	38 7.2	36 6.7	33 6.3	30 6.0	28 5.6	25 5.2	23 4.8	20 4.3	18 3.9	15 3.4	13 3.0	11 2.4		
	90	92 21.3	89 18.9	85 17.3	81 15.9	78 14.7	74 13.7	71 12.8	68 12.0	65 11.4	61 10.7	58 10.2	55 9.7	52 9.3	49 8.8	47 8.4	44 8.0	41 7.6	39 7.2	36 6.8	34 6.5	31 6.1	29 5.7	26 5.3	24 4.9	22 4.6	19 4.2	17 3.8	15 3.3		
	95	92 21.3	89 19.0	85 17.4	82 16.1	79 14.9	75 13.9	72 12.9	69 12.2	66 11.6	63 11.0	60 10.5	57 10.0	55 9.5	52 9.1	49 8.7	46 8.2	44 7.9	42 7.5	39 7.1	37 6.8	34 6.4	32 6.1	30 5.7	28 5.3	26 5.1	23 4.8	22 4.4	20 4.0		
100	93 21.3	89 19.0	86 17.5	83 16.1	80 15.0	77 13.9	73 13.1	70 12.4	68 11.8	65 11.2	62 10.6	59 10.1	56 9.6	54 9.2	51 8.9	49 8.5	46 8.1	44 7.8	41 7.4	39 7.0	37 6.7	35 6.4	33 6.1	30 5.7	28 5.4	26 5.2	24 4.9	22 4.6			
110	93 21.4	90 19.0	87 17.5	84 16.2	81 15.1	78 14.1	75 13.3	73 12.6	70 12.0	67 11.4	65 10.8	62 10.4	59 9.9	57 9.5	54 9.2	52 8.8	50 8.4	48 8.1	46 7.7	44 7.5	42 7.2	40 6.8	38 6.6	36 6.3	34 6.0	32 5.7	30 5.4	28 5.2	26 4.9	24 4.6	
120	94 21.3	91 19.0	88 17.4	85 16.2	82 15.1	80 14.1	77 13.4	74 12.7	72 12.1	69 11.5	67 11.0	65 10.5	62 10.0	60 9.7	58 9.4	55 9.0	53 8.7	51 8.3	49 7.9	47 7.7	45 7.4	43 7.2	41 6.8	40 6.6	38 6.3	36 6.1	34 5.8	33 5.6			
		13% moisture										10% moisture										5% moisture									

**Table of equilibrium moisture content values at various temperatures and humidities**

The table indicates that the relative humidity must average between 25% and 55% to maintain wood moisture content between 5-10%. This is range best suited for most of the U.S. and Canada. While temperature has an impact on relative humidity, temperature alone has little effect on wood products if the relative humidity is maintained within recommended ranges.

**Examples of moisture equilibrium table use**

The above table may be used as a guide in determining whether or not the conditions in a construction area are suitable for receiving woodwork. For example: if woodwork with an 8% average moisture content is to be installed and the average temperature in the building will be maintained at 70° F, it can be determined by following the 70° F column horizontally to the right until the lower moisture content figures of 8.3% and 7.7% are reached. Here the upper figures in the same squares show that ideally a relative humidity of between 44% and 40% should be maintained in order to achieve dimensional equilibrium. After the woodwork is painted or finished, moisture changes in the wood are retarded so that maintenance of relative humidity between the practical limits shown on the curve (between 5%-10% m.c.) of the humidity table, i.e., 25%-55% relative humidity, is usually satisfactory.

**To use the table**

Obtain wet and dry bulb readings. Subtract wet bulb reading from dry bulb reading. Find dry bulb on left margin of chart and follow across chart to column where figure at top corresponds with the difference between wet and dry readings. At point of intersection, the Upper figure in the square gives relative humidity in percent and the Lower figure gives equilibrium moisture content of the woodwork.

**IMPORTANT PRODUCT ADVISORY****ALL USERS OF ARCHITECTURAL WOODWORK PRODUCTS****DIMENSIONAL CHANGE PROBLEMS IN ARCHITECTURAL WOODWORK**

This advisory concerns prevention of dimensional problems in architectural woodwork products as the result of uncontrolled relative humidity. It is further intended as a reminder of the natural dimensional properties of wood and wood-based products such as plywood, particleboard, and high pressure decorative laminate (HPDL) and of the routine and necessary care — and responsibilities — which must be assumed by those involved.

For centuries, wood has served as a successful material for architectural woodwork, and as history has shown wood products perform with complete satisfaction when correctly designed and used. Problems directly or indirectly attributed to dimensional change of the wood are usually, in fact, the result of faulty design, or improper humidity conditions during site storage, installation, or use.

Wood is a hygroscopic material, and under normal use conditions all wood products contain some moisture. Wood readily exchanges this molecular moisture with the water vapor in the surrounding atmosphere according to the existing relative humidity. In high humidity, wood picks up moisture and swells: in low humidity wood releases moisture and shrinks. As normal minor fluctuations in humidity occur, the resulting dimensional response in properly designed construction will be insignificant. To avoid problems, it is recommended that relative humidity be maintained within the range of 25-55%. Uncontrolled extremes — below 20% or above 80% relative humidity — can likely cause problems.

Oxidation is a reaction of acids in wood (i.e., tannic acid), iron, oxygen, and moisture, whether this be relative humidity or direct moisture. Control of moisture is a simple way to protect wood products from stains as a result of oxidation.

Together with proper design, fabrication, and installation, humidity control is obviously the important factor in preventing dimensional change problems.

Architectural woodwork products are manufactured as designed from wood that has been kiln dried to an appropriate average moisture content and maintained at this condition up to the time of delivery. Subsequent dimensional change in wood is and always has been an inherent natural property of wood. These changes cannot be the responsibility of the manufacturer or products made from it. Specifically:

- Responsibility for dimensional change problems in wood products resulting from improper design rests with the designer/architect/specifier.
- Responsibility for dimensional change problems in wood products resulting from improper relative humidity exposure during site storage and installation rests with the general contractor.
- Responsibility for dimensional change problems in wood products resulting from humidity extremes after occupancy rests with engineering and maintenance.

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