NAAWS

NORTH AMERICAN ARCHITECTURAL WOODWORK STANDARDS 4.0

INSTALLATION

Excerpt

S E C T I O N - 14

WOODWORK INSTITUTE

AWMAC ARCHITECTURAL WOODWORK MANUFACTURERS ASSOCIATION OF CANADA

Forward

This excerpt is a reference guide for firms and individuals utilizing the North American Architectural Woodwork Standards (NAAWS), 4.0. It is not intended to override and/or supersede the NAAWS, but only to serve as a quick reference to its requirements.

NAAWS is both a voluntary and a definitive document, intended to spell out the requirements for satisfactory performance when referenced as part of the contract documents. Sections in the document are interrelated and are intended to be used together, not in part. For example, if a project specification requires compliance with Section 14, then compliance with Sections 1-5, 13, 15, the Appendix and the Glossary are also required, as applicable.

Disclaimers

The Sponsor Associations shall not be responsible to anyone for the use of or reliance upon this supplement. The Sponsor Associations shall not incur any obligation nor liability for damages, including consequential damages, arising out of or in connection with the use, interpretation of, or reliance upon this excerpt.

Provisions for mechanical and electrical safety have not been included. Governmental agencies or other national standards-setting organizations provide the standards for life-safety requirements.

Joint flushness and gap tolerance performance for wood products once installed outside of climate controlled (interior) environments cannot be and are not governed by NAAWS.

Illustrations are intended to assist in understanding the standards and may not include all requirements for a specific product or unit, nor do they show the only method of fabrication.

INCLUDING: Installation of all architectural woodwork

14.1 SCOPE

1 Installation of Architectural woodwork, Stairwork and Rails, Wall / Ceiling Surfacing and Partitions, Wood Passage Doors, Casework, Countertops, and Historic Restoration Work covered under the scope of these standards.

14.2 SURFACE DEFINITIONS

1 n/a

14.3 DEFAULT STIPULATION

1 n/a

14.4 GENERAL REQUIREMENTS

1 **FUNDAMENTAL GENERAL / PRODUCT REQUIREMENTS** within Section 02 (Fundamental Requirements), Section 13 (Care & Storage), and Section 15 (Tolerances) are primary to and work in conjunction with specific requirements within Product Sections 06 through 12, unless a project's contract documents require otherwise.

2 **LUMBER** & **SHEET PRODUCT COMPONENT REQUIREMENTS** used within the woodwork product sections are established by Sections 03 and 04, unless otherwise modified herein.

3 **FINISHING** requirements for the woodwork product sections are established by Sections 05, unless otherwise modified herein, and:

3.1 **PRIMING** or **SEALING** is not the responsibility of the manufacturer and/or installer, unless the material is furnished pre-finished.

3.2 **FACTORY FINISHING** when specified, requires backs of panels and trim to be factory sealed.

4 **CARE** and **STORAGE REQUIREMENTS** are covered under Section 13.

5 **TOLERANCE REQUIREMENTS** are covered under Section 15.

6 **ERRATA**, published at naaws.com, will take precedence over these requirements, subject to their date of posting and a project's bid date.

SUGGESTION

14.4 GENERAL REQUIREMENTS (continued)

7 **CONTRACTOR IS RESPONSIBLE FOR:**

7.1 **STRUCTURAL MEMBERS**, grounds, in wall blocking, backing, furring, brackets, or other anchorage required for architectural woodwork installation that becomes an integral part of walls, floors, or ceilings to which architectural woodwork will be installed, and:

7.1.1 In the absence of contract documents calling for the contractor to supply the necessary in wall blocking / backing in the wall or ceilings, either through inadvertence or otherwise, the architectural woodwork installer will not proceed with the installation until such time as the in wall blocking / backing is installed by others.

7.2 **PREPARATORY WORK** done by others (subject to inspection by the architectural woodwork installer), will be accepted or rejected for cause prior to installation, and:

7.2.1 **WALL, CEILING**, and/or **OPENING VARIATIONS** in excess of 1/4" (6.4 mm), or **FLOORS** in excess of 1/2" (12.7 mm) in 144" (3658 mm), of being plumb, level, flat, straight, square, or of the correct size are not acceptable for the installation of architectural woodwork, nor is it the responsibility of the installer to scribe or fit to gap tolerances in excess of such.

7.3 **INSTALLATION SITE** being properly ventilated, protected from direct sunlight, excessive heat and/or moisture, and that the HVAC system is functioning and maintaining the appropriate relative humidity and temperature per Section 13.

7.4 **SITE ACCESS** being safe to prevent injury to installers or damage to Architectural Woodwork.

7.5 **PRIMING** of architectural woodwork in accordance with the contract documents prior to its installation; except, if the architectural woodwork is factory finished; priming by the factory finisher is required.

8 **INSTALLER IS RESPONSIBLE FOR:**

8.1 **HAVING ADEQUATE EQUIPMENT** and experienced craftsmen to complete the installation in a first-class manner.

8.2 **CHECKING ARCHITECTURAL WOODWORK** specified and studying the appropriate portions of the contract documents, including these standards and the reviewed shop drawings to familiarize themselves with the requirements of the Grade specified, understanding that appearance requirements of Grades apply only to surfaces visible after installation.

8.3 **COLOR** and **GRAIN COMPLIANCE** of the various transparent finished woodwork pieces to ensure they are installed in compliance with the Grade specified.

8.4 **SITE VERIFICATION** to assure it is properly ventilated; protected from direct sunlight, excessive heat and/or moisture; that the HVAC system is functioning and maintaining the appropriate relative humidity and temperature; and that required priming of woodwork has been completed by others before woodwork is installed, and:

8.4.1 Notify the contractor of any variances or omissions that the contractor is responsible for.

8.5 **WOODWORK ACCLIMATION** to assure that woodwork has been acclimatized to the field conditions for a minimum of 72 hours before installation is commenced.

8.6 **SEQUENCE INSTALLATION** of woodwork specifically built or assembled in sequence for match of color and grain is installed to maintain that same sequence.

SUGGESTION

14.4 GENERAL REQUIREMENTS (continued)

9 **AESTHETIC REQUIREMENTS** only apply to surfaces visible after fabrication and installation, under building operational lighting conditions, judged from a normal viewing stance and are considered compliant if inconspicuous when viewed from 48" (1220 mm), except at **PREMIUM GRADE** it shall be viewed from 24" (610 mm).

10 **GLUE** and filler residue is not permitted on exposed faces.

11 **EQUIPMENT CUTOUTS**, including electrical and plumbing, will be cut out by the installer, provided needed templates are furnished prior to installation. They will be neatly cut and properly sized and in **HPL** or **SOLID SURFACE** will have a minimum 1/4" (6.4 mm) radius at inside corners. Specific equipment cutouts will be located and marked out by the third-party supplier.

12 **HARDWARE** will be installed per material supplier's instructions and adjusted for smooth operation within limits of the specified hardware, using all required fasteners and fasteners' provisions including appropriate countersunk fasteners suited to hardware preparations.

13 **PRODUCTS** will be installed per specifications and/or manufacturer's instructions, and be:

13.1 Securely fastened and tightly fitted with flush joints, installed plumb, level, square, and flat within 1/8" (3.2 mm) in 96" (2440 mm), including grounds and hanging system, and as applicable, joinery will be consistent throughout the project, trim of maximum available and/or practical lengths and trimmed equally from both sides when fitted for width.

13.2 Free of Warp, twisting, cupping, and/or bowing (that cannot be held true), open joints, visible machine marks, cross sanding, tear outs, nicks, chips, and/or scratches, natural defects exceeding the quantity and/or size limits defined in Sections 03 & 04.

13.3 In conformance to Section 15's **KCPI** and **SANDED SMOOTHNESS** tests.

14 **FASTENING** and **FASTENERS** will include the use of construction adhesive, finish nails, trim screws, pins and/or staples (provided staple crown does not exceed 3/16" (4.8 mm)), prohibits use of drywall or bugle head screws, and, et:

14.1 Exposed fastening at HPL and TFL, Solid Surface, CGS (Compact Laminate) or Natural / Manufactured Stone is prohibited, except at removable panels or where decorative fasteners are specified.

14.2 Allowable fastener holes, at:

14.2.1 Pre-finished materials to be filled by the installer with matching filler furnished by the manufacturer.

14.2.2 Unfinished or primed materials to be filled by the paint contractor or others.

SUGGESTION

14.4 GENERAL REQUIREMENTS (continued)

15 **FIELD JOINERY** and their workmanship, such as smoothness, gaps, flushness, flatness, etc. will be judged by the tests methods and allowable tolerances for the applicable grade established within Section 15 (Tolerances):

15.1 **GAPS** at field joints will not be considered a defect or the responsibility of the installer if caused by excessive deviations in the building's walls and ceilings being in excess of 1/4" (6.4 mm) in 144" (3658 mm) of being plumb, level, flat, straight, square, or of the correct size, or 1/2" (12.7 mm) for floors.

15.2 A Chip Out

15.3 B Overlap

15.4 C Over Machined

15.5 D Show-Through / Telegraphing

15.6 E Squareness of Panel

15.7 F Flatness of Panel / Door

15.8 G Flushness, Fabrication

15.9 H Flushness, Installation

15.10 I Flushness at Butted Edges

15.11 J-1 Flushness at Adjoining Fixed Panels

15.12 J-2 Flushness at Adjoining Casework Doors, Drawers and False Fronts

15.13 K Reveals at Adjoining Panels / Doors

15.14 L Gaps at Butted Surface Edges in Same Core Member

15.15 M Gaps at Mitered or Butted Surfaces

15.16 N Gaps at Mitered or Butted Edges

15.17 O Gaps at Parallel Members

15.18 P Gaps at Installation

15.19 Q Gaps / Reveals at Cabinet Door / Drawers

15.20 R Edge Alignment at Cabinet Door / Drawers

16 **FABRICATION** and **MODIFICATIONS** will comply to the general, material, machining, and assembly requirements within the **PRODUCT** portion of each applicable section and, if applicable, the finishing requirements in Section 05.

17 **AREAS** of **INSTALLATION** will be left broom clean, with debris removed and dumped in containers provided by the contractor. Items installed will be cleaned of pencil or ink marks, tape or adhesive residue.

18 **FIRST CLASS WORKMANSHIP COMPLIANCE IS ALWAYS REQUIRED WITHIN THESE STANDARDS.**

SUGGESTION

Important:
Section 02 (Fundamental Requirements), Section 13 (Care & Storage), and Section 15 (Tolerances) are primary to and work in conjunction with the requirements within this Section.

14.5 SECTION 05 (Finishing) - APPLICATION REQUIREMENTS

1	**TOUCH UP** of:	
1	**1**	**FACTORY FINISHED** materials are the responsibility of the installation contractor.
1	**2**	**JOBSITE FINISHED** materials are the responsibility of the finishing contractor.

SUGGESTION

14.6 SECTION 06 (Millwork) - INSTALLATION REQUIREMENTS

1		**EXPOSED FASTENERS** to be countersunk, set in quirks and reliefs where possible and be inconspicuous when viewed at 48" (1220 mm), except at"		
1	P	**Premium Grade**	Fasteners will be inconspicuous when viewed at 24" (610 mm)	
2		**JOINERY** requires S4S trim to be mitered, and profiled at:		
2	1	Inside corners be mitered and glued, except at:		
2	1 P	**Premium Grade**	They will be coped and glued.	
2	2	Outside corners will be mitered and glued.		
2	3	Ends when exposed be profiled or self-mitered and glued, except at:		
2	3 P	**Premium Grade**	They will be self-mitered and glued.	
3		**STANDING** and **RUNNING TRIM** requires:		
3	1	Running joints be scarf or butted; if butted must use a dowel, biscuit spline or spline.		
3	2	Running joints on multimember trim will be staggered a minimum of 24" (610 mm) from adjacent members.		
3	3	Base be scribed to the floor, only if so specified; however, if not scribed it will be caulked.		
3	4	Multiple joints in running trim will not be within 36" (914 mm) of each other (including ends or corners), except at:		
3	4 P	**Premium Grade**	They will not be within 48" (1220 mm).	
3	5	Scribing at flat surfaces, and at:		
3	5 P	**Premium Grade**	Profiled surfaces will also be scribed.	
4		**CLOSET RODS** will be supported at a maximum of 48" (1220 mm) on center.		
5		**DOOR** and **WINDOW FRAMES** will have rough wood bucks secured at openings, allow horns to be removed before installation, be installed per the manufacturers' basic instructions, seated on the floor, set plumb, and securely fastened through shims into the framing, and:		
5	1	Not permit pre-hung and pre-cased door / jamb assemblies that are fastened only through the casing.		
5	2	Have Legs set square with header and parallel to each other within 1/8" (3.2 mm), except at:		
5	2 P	**Premium Grade**	They will be within 1/16" (1.6 mm).	
6		**ORNAMENTAL MILLWORK** requires exposed surface scribed to the wall with 1/8" (3.2 mm) maximum gap, except at:		
6	P	**Premium Grade**	Will be 1/16" (1.6 mm) maximum gap.	

SUGGESTION

14.7 SECTION 07 (Stairwork & Rails) - INSTALLATION REQUIREMENTS

1	**EXPOSED FASTENERS** to be countersunk, set in quirks and reliefs where possible and be inconspicuous when viewed at 48" (1220 mm), except at:		
1	P	**Premium Grade**	They will be inconspicuous when viewed at 24" (610 mm)
2	**JOINERY** requires trim be coped at inside corners, except S4S will be mitered, profiled or self-mitered when trim ends are exposed, and scribed at flat surfaces, except at:		
2	P	**Premium Grade**	Joinery will be self-mitered when trim ends are exposed, scribed at both flat and shaped surfaces, and splined, doweled or biscuited when miters are over 4" (102 mm) long.

SUGGESTION

SUGGESTION

14.8 SECTION 08 (Wall/Ceiling Surfacing & Partitions) - INSTALLATION REQUIREMENTS

1	**MECHANICAL FASTENERS** are required at wall panels installed at 108" (2743 mm) or more above finished floor, and ceiling panels regardless of height.		
2	**CONCEALED FASTENING** is required wherever possible at wall / Ceiling surfacing and partitions. Use of **FURRING / HANGING SYSTEMS** (which are in accordance with applicable codes and regulations) are acceptable for blind installation and a maximum of 3/4" (19.0 mm) reveal is permitted at the top of panels to allow installation clearance for the panel.		
3	**EXPOSED FASTENERS** to be countersunk, set in quirks and reliefs where possible, be inconspicuous when viewed at 48" (1220 mm), and permits use of finish nails, except at:		
3	P	**Premium Grade**	They will be inconspicuous when viewed at 24" (610 mm), and permit use of pins and/or construction adhesive.
4	**JOINERY** requires trim be coped at inside corners, except S4S will be mitered, profiled or self-mitered when trim ends are exposed, and scribed at flat surfaces, except at:		
4	P	**Premium Grade**	Joinery will be self-mitered when trim ends are exposed, scribed at both flat and shaped surfaces, and splined, doweled or biscuited when miters are over 4" (102 mm) long.
5	**REVEAL STRIPS** that are grooved into paneling are to be allowed to expand and contract in reaction to changing relative humidity.		
6	**EXPANSION JOINTS** will be provided equivalent to 1/8" (3.2 mm) per 48" (1220 mm) of linear elevation, and:		
6	1	The minimum reveal gap between panels will be calculated as the length of the panel times 0.002 for particleboard core and 0.0015 for medium density fiberboard (MDF) core.	
7	**PANELING** will be furred and installed plumb within 1/16" (1.6 mm) in 96" (2440 mm), in such a way as to avoid deflection when normal pressure is applied, while free of warp exceeding at 3/64" (1.2 mm) per linear 12" (305 mm),except at:		
7	P	**Premium Grade**	It will be free of warp exceeding 1/32" (0.8 mm) per linear 12" (305 mm).

Continued on next page

14.8 SECTION 08 (Wall/Ceiling Surfacing & Partitions) - INSTALLATION REQUIREMENTS

Continued from previous page

8	**VENEER** surfacing requires edges of core that are not veneer edged have one of coat sealer applied before installation, and veneer **JOINTS** will be plumb within 3/16" (4.8 mm) **LOSS** at side, between sequenced adjacent panels will not exceed: 1-1/2" (38.1 mm) **LOSS** at end, between sequenced adjacent panels at end match will not exceed: 2" (50.8 mm) **END MATCH ALIGNMENT,** between sequenced adjacent panels will not exceed: 3/8" (9.5 mm) Except at:			
8	**P**	**Premium Grade**	**JOINTS** will be plumb within 1/8" (3.2 mm) **LOSS** at side, will not exceed 1" (25.4 mm) **LOSS** at end, will not exceed 1-1/2" (38.1 mm). **END MATCH ALIGNMENT,** will not exceed 3/16" (4.8 mm).	
8	**1**	**FIGURE** and/or **HEART PROGRESSION** will be uniform and natural between adjacent sequenced panels and not exceed 1" (25.4 mm), except at:		
8	1	**P**	**Premium Grade**	It will not exceed 1/2" (12.7 mm).
8	1	**1**	Doors and other components that adjoin at blueprint panels, where progression will not exceed 2" (50.8 mm), except at:	
8	1	1	**P** **Premium Grade**	It will not exceed 1-1/2" (38.1 mm).
9	**SOLID WOOD** surfacing requires field joints to be factory prepared to the greatest extent possible with feature strips and joint trim furnished oversize, where possible.			
10	**HPL and TFL** surfacing requires:			
10	**1**	**EDGES** of core that are not HPL edged have one coat sealer applied before installation.		
10	**2**	**PATTERN LINES** be plumb, within 3/16" (4.8 mm), except at:		
10	2	**P**	**Premium Grade**	They will be within 1/8" (3.2 mm).

Continued on next page

SUGGESTION

14.8 SECTION 08 (Wall/Ceiling Surfacing & Partitions) - INSTALLATION REQUIREMENTS

Continued from previous page

11	**SOLID SURFACE** surfacing requires installation over suitable cores based on the material supplier's recommendations, and:				
11	**1**	**SEALANTS** and **ADHESIVES** compatible with the individual material supplier's recommendations or sealants specially developed to achieve the best color match.			
11	**2**	**EXPANSION** joints will be furnished where required by building design or material supplier recommendations.			
11	**3**	**FIELD SEAMS** between panels and at outside corners will be hard seamed with the material supplier's hard seaming material or equal, watertight and gap free. Joints may be butt-jointed, lapped or V-grooved per material supplier's instructions. There may be a visual break at patterned or veined materials. Soft seaming is permitted at building expansion joints, inside corners, and when abutting other materials, using color-coordinated 100% Silicone sealant with minimum 50% movement capability. Soft seams with or without battens are also permitted where required by material suppliers maximum wall length limitations for the installation environment. Soft seams shall not exceed ⅛" (3.2 mm) in width (¼" (6.4 mm) at building expansion joints). Thermoformed, V-Coved, or other corner details must be so specified. Gaps at ceiling transitions shall be minimum ⅛" (3.2 mm) using color-coordinated silicone, and:			
11	3	1	Hard seams shall not be visibly noticeable when viewed from 48" (1220 mm), except at:		
11	3	1	**P**	**Premium Grade**	Hard Seams will be inconspicuous when viewed at 24" (610 mm).
11	**4**	**VEINED / SWIRLED** solid surface may have random patterns that cannot be matched at seams. Pattern breaks, changes and color variations may occur, and will not be considered a defect in materials or workmanship.			
12	**CGS** (Compact Laminate) surfacing requires:				
12	**1**	**SEALANTS** and **ADHESIVES** compatible with the individual material supplier's recommendations or sealants specially developed to achieve the best color match.			
12	**2**	**VERTICAL SURFACING** will be installed over suitable cores based on the material supplier's recommendations.			
12	**3**	**EXPANSION CLEARANCE** is required of at least 3/32" (2.4 mm) for every 120" (3048 mm) in length.			
12	**4**	**CAULKED JOINTS** will be approximately 1/8" (3.2 mm) wide to allow satisfactory caulking penetration and expansion.			
12	**5**	**CONCEALED FASTENING,** approved by material supplier and design authority, will be used and a maximum 3/4" (19.0 mm) reveal is permitted at the top of panels either under casework or at ceiling to facilitate such.			

14.9 SECTION 09 (Passage Doors)- INSTALLATION REQUIREMENTS

1		**INSTALLERS** will be furnished with approved hardware schedule and required templates, and metal frame shop drawings, including the locations of the hardware preparations.
2		**PRE-FIT** and **PRE-MACHINED** doors are to be installed in accordance with the material supplier's data.
3		**UTILITY** or **STRUCTURAL STRENGTH** of doors will not be impaired in fitting them to the opening, applying hardware, preparing for lights, louvers, plant-ons, or other detailing.
4		**FIRE DOOR ASSEMBLIES**, including 20, 30, 45, 60, and 90 minute rated, will be prepared for locks, latches, hinges, remotely operated or monitored hardware, concealed closers, glass lights, vision panels, louvers, astragals, HPL and TFL in conformance to the material supplier's Label Service requirements, and labels are prohibited from being removed.
5		**DOORS** and their **ACCESSORIES** will be hung plumb and level within 1/16" (1.6 mm) of the height and width of the door assembly.
6		**WHEN INSTALLED**, doors will operate smoothly and easily without binding, and pairs of doors, when closed, will be within 1/16" (1.6 mm) of flush at the meeting edge.
7		Door **FACES** will not extend more than 1/16" (1.6 mm) beyond the face of the jamb or 1/8" (3.2 mm) behind the face of the jamb of the jamb unless utilizing pivot or offset hinges.
8		**FITTING** for:
8	1	**WIDTH** requires the door to be trimmed equally from both sides; however, on **FIRE RATED DOORS**, in order to preserve the label, they will be trimmed per the material supplier's requirements.
8	2	**HEIGHT** prohibits trimming top or bottom rails more than 3/4" (19.0 mm), and **FIRE RATED DOORS** will be trimmed on the bottom rail only.
8	3	Doors which are trimmed will maintain bevel of 3 degrees unless otherwise indicated by hardware requirements.
9		**CLEARANCE** between the door and frame members (except at fire rated doors where applicable codes apply) will be a maximum of 1/8" (3.2 mm) on the hinge and lock sides, the top of the door, and between the meeting edges of doors in pairs, and:
9	1	Installer will not be responsible for clearances in excess of these dimensions if the door manufacturer made an error on pre-fit widths or locations for mortise hardware.
9	2	Clearance at the bottom of fire rated doors will conform to NFPA 80 and at non-rated doors will be a minimum of 1/4" and a maximum of 5/8" measured from the bottom of the door to the highest point of the finish floor that the door swings over.
10		**HARDWARE** will be installed in the locations and by methods of attachment appropriate for the specific door construction so that it operates as intended, and:
10	1	Templates for specific hardware preparation and installation are typically available from the material supplier.
10	2	Installed using pilot holes and furnished fasteners or fastener provisions and when fastener provisions are countersunk, fasteners will be countersunk.
10	3	With appropriate provided fasteners (fully threaded) on non-rated and fire rated doors.

Continued on next page

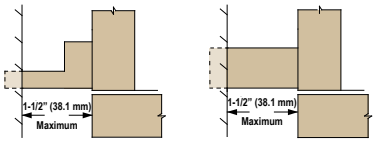
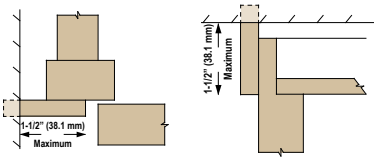
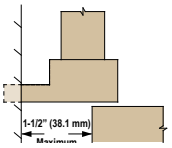
14.9 SECTION 09 (Passage Doors)- INSTALLATION REQUIREMENTS

Continued from previous page

11	**LEAF HINGES** on:			
11	**1**	**SOLID CORE** doors require:		
11	1	**1**	A minimum of two hinges for doors up to 60" (1524 mm) in height with an additional hinge for each additional 30" (762 mm) or portion thereof in door height, and space between hinges will be equal.	
11	**2**	**HOLLOW CORE** doors weighing less than 50 lbs. (22.7 kg) and not exceeding 90" (2286 mm) in height only require two hinges.		
12	**CUTOUTS** for lights or louvers, if applicable, will be protected from water entering the door core by a satisfactory method such as metal flashing at the bottom of the cutout.			
13	**APPLIED TRIM** will:			
13	**1**	Be **MITERED** at outside corners, and **EXPOSED ENDS** will be profiled or self-mitered **INSIDE CORNERS** will be mitered except at:		
13	1	**P**	**Premium Grade**	**EXPOSED ENDS** will be self-mitered. **INSIDE CORNERS** will be coped.

SUGGESTION

14.10 SECTION 10 (Casework) - INSTALLATION REQUIREMENTS

1				**GAPS, EDGE ALIGNMENT** and **FLUSHNESS** of doors and drawers will be uniform and within the tolerances set forth in the Product portion of Section 10, and:
1	1			Door and drawer fronts will align vertically and horizontally, and:
1	1	1		Be flush (on the same plane) to one another.
1	1	2		Adjustments within manufacturers hardware tolerances are the responsibility of the installer.
2				**FREESTANDING** end panels will be securely installed, and at:
2	P		**Premium Grade**	They will be installed with concealed fasteners / hardware.
3				**SCRIBE MATERIAL** will be **FURNISHED** by the manufacturer where cabinets contact finished walls or ceiling, matching the exposed surfaces, and:
3	1			Where scribing is required at both ends of a cabinet run, it will utilize the same type of scribing at each end and be uniform in scribing width not to exceed 20% in variance.
3	2			Be furnished in maximum available lengths, joints not allowed in material less than 96" (2440 mm).
3	3			Allow **COLOR COMPATIBLE CAULKING** not to exceed 1/8" (3.2 mm).
3	4			**SCRIBE FILLERS** will not exceed 1-1/2" (38.1 mm) in width, except Inside corners where two elevations of casework meet will be equal in width, and not to exceed a maximum of 3" in width unless required for hardware clearance during operation. 
3	5			**SCRIBE MOLDS** will not exceed 1-1/2" (38.1 mm) in width, with end joints beveled and exposed corners mitered or coped, except at: 
3	5	P	**Premium Grade**	Scribe molds are not allowed.
3	6			**SCRIBE ALLOWANCE** will not exceed 1-1/2" (38.1 mm) in width. 
3	7			**SOFFIT** or **FASCIA PANELS are** to be furnished in maximum available lengths, joints are not allowed in material less than 95-1/2" (2426 mm) at horizontal grain or directional pattern and 47-1/2" (1207 mm) at vertical grain or directional pattern, and will:
3	7	1		Be a minimum of 3/4" (19.0 mm) in thickness.
3	7	2		Have grain direction (if any) run vertically, or be of manufacturer's choice if less than, 12" (305 mm) tall, except at:
3	7	2 P	**Premium Grade**	Larger than 1-1/2" (38.1 mm) tall.
3	8			At tall and wall hung cabinets, closure panels will be provided at top and bottom voids.
3	9			Allowable gap at the back-bottom edge of wall hung cabinets will not exceed 1/4" (6.4 mm) and, when scribing is necessary, the use of a separate scribe mold is permitted:

Continued on next page

North American Architectural Woodwork Standards 4.0, Effective September 01, 2021, ©2021 AWMAC | Woodwork Institute, as updated by ERRATA through December 01, 2021 and may be furthe updated by errata at naaws.com

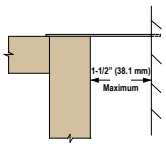
SUGGESTION

14.10 SECTION 10 (Casework) - INSTALLATION REQUIREMENTS

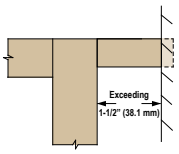
Continued from previous page

4 **CLOSURE** provision is required at voids or open spaces between cabinets and walls, such as at the top of tall and upper cabinets and the bottom of upper cabinets caused by scribing or angle turns, and:

4 **1** At non-visible voids, 1-1/2" (38.1 mm) or less in width, a piece of VGP-HPL may be used as a closure cap.



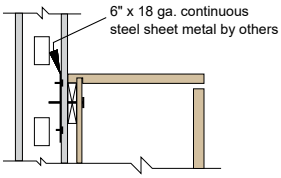
4 **2** At non-visible voids, exceeding 1-1/2" (38.1 mm) in width, a minimum 3/4" (19.0 mm) closure filler will be provided of manufacturer's choice.

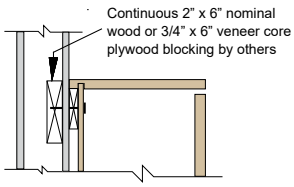


4 **3** At visible voids, a minimum 3/4" (19.0 mm) closure filler will be provided matching the adjacent surface.

5 **CASEWORK WALL ANCHORAGE**, except for peninsula / island or base casework with mechanical spacing allowances (because of the need to be engineered on an individual basis), requires:

5 **1** **CONTINUOUS IN WALL BLOCKING** or **BACKING** of at least 2" x 6" (50.8 mm x 152 mm) nominal wood, 3/4" x 6" (19 mm x 152 mm) veneer core plywood or 6" x 18-gauge (152 mm x 1.2 mm) steel sheet metal, installed by others, be located in all wood or metal stud walls as shown below:





Continued on next page

North American Architectural Woodwork Standards 4.0, Effective September 01, 2021, ©2021 AWMAC | Woodwork Institute, as updated by ERRATA through December 01, 2021 and may be furthe updated by errata at naaws.com

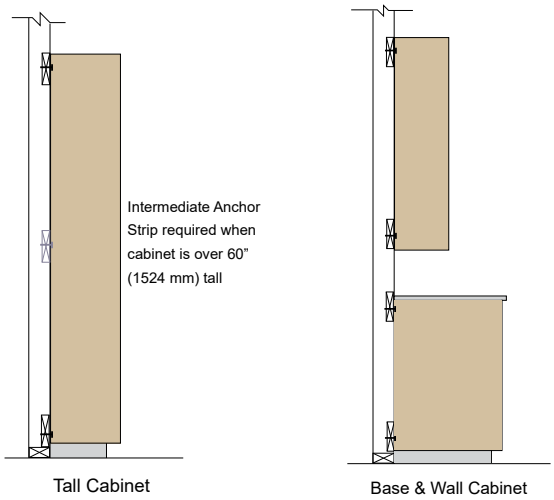
SUGGESTION

14.10 SECTION 10 (Casework) - INSTALLATION REQUIREMENTS

Continued from previous page

5 CASEWORK WALL ANCHORAGE (continued)

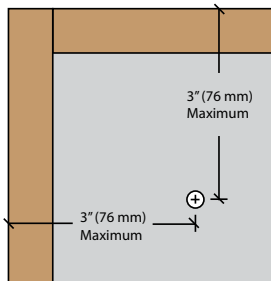
5 2 **MANUFACTURER** to provide appropriate location layouts on their shop drawings for in wall blocking or backing for all tall, base, and wall hung casework for both top and bottom runs of fasteners, as shown below:



5 3 **ADJACENT** cabinet units are to be fastened together at the front with a minimum of two # 8 (0.164" (4.1 mm)) x 1-1/4" (31.8 mm) flat, oval, pan head screws or binder head sex bolts, a maximum of 30" (762 mm) on center, and at exposed interior surfaces, cover caps of compatible color to interior are required.

5 4 **ANCHORAGE FASTENERS** (at **NON-SEISMIC** installations) are to be neatly installed through the back and anchor strip (if applicable), at the top and bottom at each cabinet body, and at the intermediate height of cabinets over 60" (1524 mm) tall, and:

5 4 1 **EACH CABINET UNIT** or undivided span will have a minimum of four anchorage fasteners; two at the top and two at the bottom, subject to them being horizontally and vertically within 3" (76 mm) of the outside end, top or bottom of the cabinet unit and equally spaced, at a maximum horizontal spacing of 16" (406 mm) on center, except at wall cabinet units over 48" (1220 mm) in height it will be 12" (305 mm) on center.



5 4 2 Fasteners will be a minimum of 3" (76 mm) x #10 (0.190" (4.8 mm)) diameter screw with a surface bearing head, and:

5 4 2 1 Will achieve a minimum penetration of 1" (25.4 mm) into solid wood wall studs and/or solid wood / plywood in wall blocking.

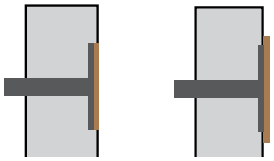
5 4 2 2 Will achieve a minimum penetration of three full screw threads extending beyond steel wall studs and minimum 18-gauge steel in wall blocking.

5 4 2 3 **CONCRETE** or **MASONRY BLOCK WALL** (CMU) grouted solid **WALLS** fasteners will be minimum #10 concrete screw with surface bearing head, with minimum 2" (50.8 mm) embedment.

Continued on next page

14.10 SECTION 10 (Casework) - INSTALLATION REQUIREMENTS

Continued from previous page

5	**CASEWORK WALL ANCHORAGE** (continued)				
5	**4**	**ANCHORAGE FASTENERS** (at **NON-SEISMIC** installations) (continued)			
5	4	**3**	At Exposed Interior surfaces, exposed screw heads will be painted or covered with caps / covers of compatible color to interior surface, and:		
5	4	3	**1**	Use of specialty installation screws intended for flush or recessed set with matching adhesive backed covers may be used at:	
5	4	3	1	**1**	Minimum 1/4" (6.4 mm) thick backs when the head is drawn tight to the back surface; however, not recessed into the back. 
5	4	3	1	**2**	Minimum 1/2' (12.7 mm) thick backs with the head recessed a maximum of 1/8" (3.2 mm) into the back surface to facilitate surface or flush mounting of the cover. 
5	4	**4**	Does **NOT** allow use of drywall, tapered or bugle head screws.		
5	4	**5**	Locking hanging cleats, or other concealed method of installation may be used, provided it has been independently tested to show compliance to the NAAWS Casework Evaluation Tests 10.01 (Fabrication Joinery) as shown and qualified in the **APPENDIX**.		
5	**5**	Bases or toes are not required to be anchored to the floor; however:			
5	5	**1**	Separate bases or toes are required to be mechanically fastened in the field to the cabinet bottom with flat head screws set flush or slightly recessed, to prevent their movement, and screw heads in cabinet bottoms, where exposed, will be covered with color compatible adhesive caps.		

SUGGESTION

14.10 - A - ADDITIONAL GENERAL SEISMIC REQUIREMENTS

1 **CAUTION** - It is the user's responsibility to confirm compatibility, acceptability and scope of these seismic engineered installation standards. The Sponsor Associations will not be responsible to anyone for the use of or reliance upon these standards, nor will they incur any obligation nor liability for damages, including consequential damages, arising out of or in connection with the use, interpretation of, or reliance upon these standards.

2 These engineered seismic casework installation standards are based on the Woodwork Institutes Pre-Approvals of 2010 (for base, peninsula and mechanical chase base cabinets) and 2020 (for tall storage and wall cabinets) California Building Code (CBC) requirements for use in California (approved by the California Office of Statewide Health Planning and Development (OSHPD) and/or accepted by California Division of State Architecture (DSA)); however, may also be adequate for use in other areas that base their requirements on the International Building Code (IBC). This engineering is applicable for the installation of casework in building structures:

2.1 At any height within the building where z/h <= 1.0.

2.2 Where the S_{DS} is not greater than 1.93 for base, peninsula and mechanical chase cabinets or 2.0 for wall and tall storage cabinets, and includes:

2.3 At concrete or concrete masonry unit (CMU) wall construction when grouted solid.

2.4 At wood or metal stud wall construction with either continuous 3 x 6 (76 mm x 152 mm) or 16 gauge in wall blocking respectively, with one or two layers of 5/8" (15.9 mm) sheetrock.

2.5 Where Casework construction is of plywood, particleboard, MDF or CGS (Compact Laminate) core and in compliance with the minimum requirements of the North American Architectural Woodwork Standards (NAAWS), including:

2.5.1 Base cabinets, up to 36" (914 mm) tall x 24" (610 mm) body depth x 48" (1220 mm) wide, including peninsula and those with mechanical chase.

2.5.2 Wall cabinets up to 48" (1220 mm) tall x 18" (457 mm) body depth x 48" (1220 mm) wide.

2.5.3 Tall storage cabinets up to 96" (2440 mm) tall x 24" (610 mm) body depth x 48" (1220 mm) wide.

2.5.4 Peninsula base cabinets up to 36" (914 mm) tall x 36" (914 mm) body depth x 48" (1220 mm) wide.

2.5.5 Mechanical chase base cabinets up to 42" (1067 mm) tall x 36" (914 mm) body depth and 48" (1220 mm) wide.

3 **CONTRACTOR IS RESPONSIBLE FOR:**

3.1 **FURNISHING** and **INSTALLING** in wall blocking and backing anchorage required for seismic casework installation, in accordance with these standards, that becomes an integral part of the walls to which architectural woodwork will be installed, and:

3.1.1 In the absence of contract documents calling for the contractor to supply the necessary in wall blocking / backing in the wall, either through inadvertence or otherwise, the architectural woodwork installer will not proceed with the installation until such time as the in wall blocking / backing is installed by others.

3.1.2 In wall blocking / backing installed by others will be subject to inspection by the architectural woodwork installer prior to being covered by wall finish and may be accepted or rejected for cause prior to installation.

14.10 - A - ADDITIONAL GENERAL SEISMIC REQUIREMENTS (continued)

4 **INSTALLER IS RESPONSIBLE FOR:**

4.1 Ensuring that the casework shop drawings:

4.1.1 Are in compliance with the NAAWS's minimum requirements as established in Section 01, including:

4.1.1.1 Casework elevations showing the center-line height and horizontal locations of all required, continuous, internal wall blocking furnished by others.

4.1.1.2 A casework fastener schedule, clearly showing the type, size, location and maximum spacing of the installation fasteners.

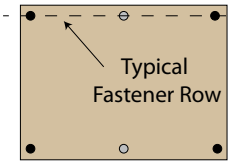
4.2 At wood or metal stud walls, prior to application of wall surfacing, examine, approve and acknowledge blocking compliance.

SUGGESTION

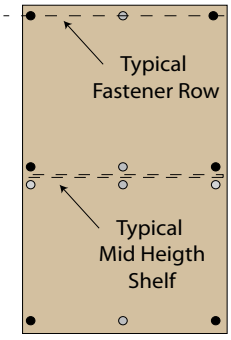
SUGGESTION

14.10 - A SECTION 10 (Casework) - ADDITIONAL SEISMIC INSTALLATION REQUIREMENTS

1				Nailers will be minimum ¾" (19.0 mm) in thickness, of veneer core plywood (Struct. 1), MDF Grade 155 or Douglas Fir with a specific gravity of 0.5 or higher.
2				Tall storage cabinets will have a fixed shelf approximately mid height securely attached to the cabinet back and nailers.
3				**WALL BLOCKING / BACKING** will be at:
3	1			**WOOD STUD WALLS**, a minimum 3 x 6 nominal Douglas Fir (#2 or better) or 16 gauge x 6" (152 mm) , 50 KSI steel sheet metal.
3	2			**METAL STUD WALLS**, a minimum 16 gauge x 6" (152 mm), 50 KSI steel sheet metal.
4				**FASTENERS** will be at
4	1			**WOOD STUD WALLS** with:
4	1	1		**WOOD BLOCKING**, a minimum 3" (76 mm) x #14 (0.242" (6.1 mm)) washer head wood screw (WS) or Sheet Metal Screws (SMS) with minimum 2-1/2" (63.5 mm) penetration.
4	1	2		**SHEET METAL BACKING**, a minimum 3" (76 mm) x #14 washer head Sheet Metal Screws (SMS) with minimum of three threads extending beyond sheet metal backing.
4	2			**METAL STUD WALLS** with sheet metal backing, a minimum #14 washer head Sheet Metal Screws (SMS) with minimum of three threads extending beyond sheet metal backing.
4	3			**CONCRETE WALLS** of minimum 4" (102 mm) in thickness, a 3/8" Hilti KWIK Bolt TZ, ICC ESR-1917 (or equal) with minimum 2" (50.8 mm) embedment and minimum 6" (152 mm) clearance from any wall edge.
4	4			**CONCRETE MASONRY BLOCK WALL** (CMU), grouted solid, a 3/8" HILTI KWIK Bolt – 3 (or equal) with minimum 2-1/2" (63.5 mm) embedment and minimum 4" (102 mm) clearance from any wall edge.
5				**FASTENER PLACEMENT** requires:
5	1			Minimum of 4 fasteners, one each in the four corners of each cabinet box,



EXCEPT TALL STORAGE CABINETS require a minimum of 6 fasteners with the additional requirement of one or two rows of fasteners at the mid-height fixed shelf.



Continued on next page

North American Architectural Woodwork Standards 4.0, Effective September 01, 2021, ©2021 AWMAC | Woodwork Institute, as updated by ERRATA through December 01, 2021 and may be furthe updated by errata at naaws.com

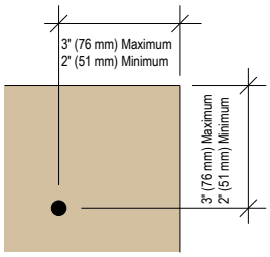
SUGGESTION

14.10 - A SECTION 10 (Casework) - ADDITIONAL SEISMIC INSTALLATION REQUIREMENTS

Continued from previous page

5 **FASTENER PLACEMENT** (continued)

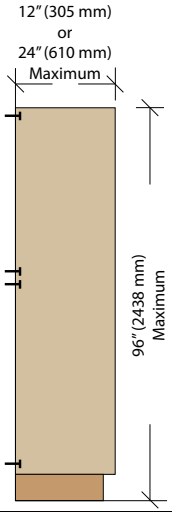
5 2 Each corner fastener will be centered a maximum of 3" (76 mm) and minimum of 2" (50.8 mm) from the outside edge, top and/or bottom of the cabinet box.



5 3 All additional fastener requirements outlined for specific cabinet types will be maximum of 3" (76 mm) and minimum of 2" (50.8 mm) from the top and/or bottom of the cabinet box.

6 **FASTENER QUANTITY** and **SPACING** requires at:

6 1 **TALL STORAGE CABINETS** not exceeding 48" (1220 mm) in width, 96" (2440 mm) in height,



and:

6 1 1 12" (305 mm) or less in depth, excluding doors or drawer fronts at:

6 1 1 1 **WOOD** or **METAL STUD** walls requires two additional horizontal rows of fasteners, approximately 2" (50.8 mm) apart split vertical above and below the fixed mid-height shelf and with up to:

6 1 1 1 1 **1 LAYER** of 5/8" (15.9 mm) drywall the maximum horizontal spacing between fasteners in the top, bottom or middle rows will not exceed 12" (305 mm) on center.

6 1 1 1 2 **2 LAYERS** of 5/8" (15.9 mm) drywall the maximum horizontal spacing between fasteners in the top, bottom or middle rows will not exceed 10-1/2" (267 mm) on center.

6 1 1 2 **CONCRETE** or **CONCRETE BLOCK** walls requires one additional horizontal row of fasteners below the fixed mid-height shelf with the maximum horizontal spacing between fasteners in the top, bottom or middle rows not exceeding 14" (356 mm) on center.

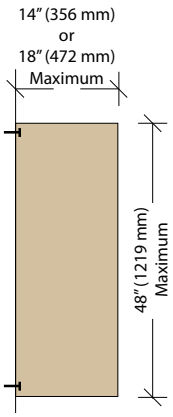
Continued on next page

SUGGESTION

14.10 - A SECTION 10 (Casework) - ADDITIONAL SEISMIC INSTALLATION REQUIREMENTS

Continued from previous page

6	**FASTENER QUANTITY** and **SPACING** (continued)				
6	1	**TALL STORAGE CABINETS** (continued)			
6	1	2	24” (610 mm) or less in depth, excluding doors or drawer fronts at:		
6	1	2	1	**WOOD** or **METAL STUD** walls requires two additional horizontal rows of fasteners, approximately 2” (50.8 mm) apart split vertical above and below the fixed mid-height shelf with up to:	
6	1	2	1	1	1 layer of 5/8” (15.9 mm) drywall the maximum horizontal spacing between fasteners in the top, bottom or middle rows will not exceed 6” (152 mm) on center.
6	1	2	1	2	2 layers of 5/8” (15.9 mm) drywall the maximum horizontal spacing between fasteners in the top, bottom or middle rows will not exceed 5-1/4” (133 mm) on center.
6	1	2	2	**CONCRETE** or **CONCRETE BLOCK** walls requires one additional horizontal row of fasteners below the fixed mid-height shelf and at:	
6	1	2	2	1	**CONCRETE** walls the maximum horizontal spacing between fasteners in the top, bottom or middle rows will not exceed 14” (356 mm) on center.
6	1	2	2	2	**CONCRETE BLOCK** walls the maximum horizontal spacing between fasteners in the top, bottom or middle rows will not exceed 21” (533 mm) on center.
6	2	**WALL HUNG CABINETS** not to exceed 48” (1220 mm) in width or height, and:			
6	2	1	14” (356 mm) or less in depth, excluding doors or drawer fronts at:		
6	2	1	1	**WOOD** or **METAL STUD** walls with up to:	
6	2	1	1	1	1 layer of 5/8” (15.9 mm) drywall the maximum horizontal spacing between fasteners in the top or bottom will not exceed 8” (203 mm) on center.
6	2	1	1	2	2 layers of 5/8” (15.9 mm) drywall the maximum horizontal spacing between fasteners in the top or bottom rows will not exceed 6” (152 mm) on center.
6	2	1	2	**CONCRETE** or **CONCRETE BLOCK** walls the maximum horizontal spacing between fasteners in the top or bottom rows will not exceed 14” (356 mm) on center.	



Continued on next page

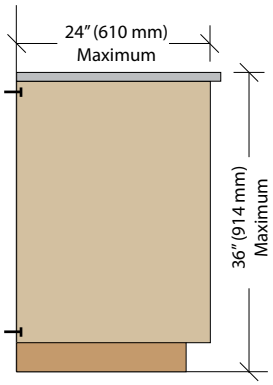
North American Architectural Woodwork Standards 4.0, Effective September 01, 2021, ©2021 AWMAC | Woodwork Institute, as updated by ERRATA through December 01, 2021 and may be furthe updated by errata at naaws.com

SUGGESTION

14.10 - A SECTION 10 (Casework) - ADDITIONAL SEISMIC INSTALLATION REQUIREMENTS

Continued from previous page

6	**FASTENER QUANTITY** and **SPACING** (continued)					
6	2	**WALL HUNG CABINETS** (continued)				
6	2	2	18” (457 mm) or less in depth, excluding doors or drawer fronts at:			
6	2	2	1	**WOOD** or **METAL STUD** walls requires two horizontal rows of fasteners at the top and bottom, approximately 2” (50.8 mm) apart vertically, with up to:		
6	2	2	1	1	1 layer of 5/8” (15.9 mm) drywall, and the maximum horizontal spacing between fasteners in the top or bottom rows will not exceed 12” (305 mm) on center.	
6	2	2	1	2	2 layers of 5/8” (15.9 mm) drywall, and the maximum horizontal spacing between fasteners in the top or bottom rows will not exceed 10” (254) on center.	
6	2	2	2	**CONCRETE** or **CONCRETE BLOCK** walls and the maximum horizontal spacing between fasteners in the top or bottom rows will not exceed 10-1/2” (267 mm) on center.		
6	3	**BASE CABINETS** not to exceed 36” (914 mm) in height (including countertop) and 24” (610 mm) in depth (excluding doors or drawer fronts), and **INCLUDING** the two fasteners in each corner of the top and bottom rows of fasteners, the total number of fasteners per row will be at:				
6	3	1	**WOOD** or **METAL STUD** walls with up to 2 layer of 5/8” (15.9 mm) drywall, 2 for cabinets 12” (305 mm) or less in width, 3 for cabinets 24” (610 mm) or less in width, 4 for cabinets 36” (914 mm) or less in width and 5 for cabinets 48” (1220 mm) or less in width.			
6	3	2	C**ONCRETE** walls, 2 for cabinets 24” (610 mm) or less in width and 3 for cabinets 48” (1220 mm) or less in width.			
6	3	3	**CONCRETE BLOCK** walls, 2 for cabinets 24” (610 mm) or less in width, 3 for cabinets 36” (914 mm) or less in width and 4 for cabinets 48” (1220 mm) or less in width.			



Continued on next page

North American Architectural Woodwork Standards 4.0, Effective September 01, 2021, ©2021 AWMAC | Woodwork Institute, as updated by ERRATA through December 01, 2021 and may be furthe updated by errata at naaws.com

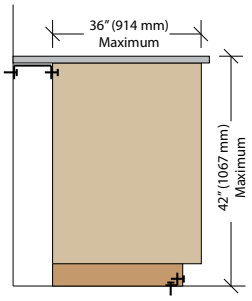
SUGGESTION

14.10 - A SECTION 10 (Casework) - ADDITIONAL SEISMIC INSTALLATION REQUIREMENTS

Continued from previous page

6 **FASTENER QUANTITY** and **SPACING** (continued)

6 4 **BASE CABINETS** with **UTILITY CHASE** not to exceed 42" (1067 mm) in height (including countertop), 36" (914 mm) in depth (excluding doors, drawer fronts and utility chase) and 48" (1220 mm) in width requires:



Integral toe base construction, and anchorage of the:

6 4 1 **TOE BASE** to the floor at front only, requires a continuous (for each cabinet unit) bent 16 gauge sheet metal 2.5" x 2.5" (63.5 mm x 63.5 mm) angle (FY+50KSI) mounted to the floor with 3/8" diameter Simpson Strong Bolt 2 (or equal) with minimum 2" (50.8 mm) embedment within 2" (50.8 mm) of each end and a maximum of 11" (279 mm) on center and fastened to the front left / right toe base member with # 12 sheet metal screws, driven through the toe base member into the metal angle within 4" (102 mm) of each end and a maximum of 12" (305 mm) on center.

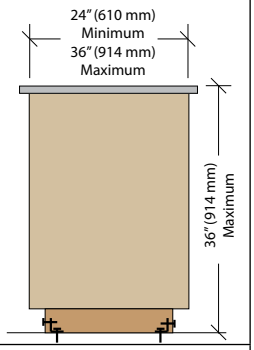
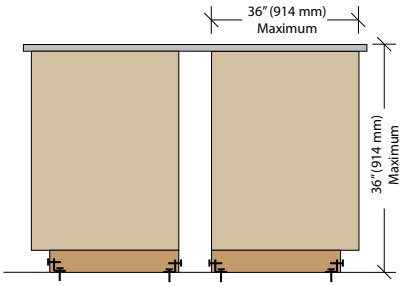
6 4 2 **CABINET BACK** to the wall requires a continuous bent 16 gauge sheet metal channel (FY=50KSI) with 2" (50.8 mm) legs be mounted just below the countertop to bridge between the cabinet back and wall and will be fastened to the wall with a uniformly spaced, continuous horizontal row of fasteners at a maximum of 11" (279 mm) on center with the end fasteners within 2" (50.8 mm) of each end of the channel, and cabinet backs will be fastened to the continuous metal channel, including the two fasteners in each corner of the top row of fasteners, the total number of fasteners at cabinets:

6	4	2	1	12" (305 mm) or less in width, will be 2.
6	4	2	2	24" (610 mm) or less in width, will be 3.
6	4	2	3	36" (914 mm) or less in width, will be 4.
6	4	2	4	48" (1220 mm) or less in width, will be 5.

Continued on next page

14.10 - A SECTION 10 (Casework) - ADDITIONAL SEISMIC INSTALLATION REQUIREMENTS

Continued from previous page

6	**FASTENER QUANTITY** and **SPACING** (continued)			
6	5			**PENINSULA CABINETS** of single row double faced casework not to exceed 36" (914 mm) in height (including countertop), a minimum of 24" (610 mm) or a maximum of 36" (914 mm) in depth (excluding doors and drawer fronts) and 48" (1220 mm) in width requires integral toe base construction and: 
6	5	1		Anchorage of the toe base to the floor at front with a continuous (for each cabinet unit), a bent 16 gauge sheet metal 2.5" x 2.5" (63.5 mm x 63.5 mm) angle (FY+50KSI) will be mounted to the floor with 3/8" diameter Simpson Strong Bolt 2 (or equal) with minimum 2" (50.8 mm) embedment within 2" (50.8 mm) of each end and a maximum of 11" (279 mm) on center, with a minimum of:
6	5	1	1	13.5" (343 mm) on center between front and back anchors at cabinets 24" (610 mm) in depth.
6	5	1	2	25.5" (648 mm) on center between front and back anchors at cabinets 36" (914 mm) in depth.
6	5	1	3	Fastened to the left / right toe base member with # 12 (0.216" (5.9 mm)) sheet metal screws, driven through the front of the toe base member into the metal angle within 4" (102 mm) of each end and a maximum of 12" (305 mm) on center.
6	6			**PENINSULA CABINETS** of double row casework with **UTILITY CHASE**, each row of casework will not exceed 36" (914 mm) in height (including countertop), 36" (914 mm) in depth (excluding doors and drawer fronts) and 48" (1220 mm) in width requires same case fastening as single row, double faced peninsula casework. 

North American Architectural Woodwork Standards 4.0, Effective September 01, 2021, ©2021 AWMAC | Woodwork Institute, as updated by ERRATA through December 01, 2021 and may be furthe updated by errata at naaws.com

SUGGESTION

14.11 SECTION 11 (Countertops & Horizontal Surfaces) - INSTALLATION REQUIREMENTS

1						**SPACING / SUPPORT MATERIALS** required for installation of a countertop are the responsibility of the countertop manufacturer.
2						**HORIZONTAL REVEAL** between the lower edge of the countertop and the upper edge of the adjacent door or drawer front at base cabinets with countertops will be a consistent 1/4" (6.4 mm) +/- 1/8" (3.2 mm), except:
2	1					At laboratory casework, will be 1/4" (6.4 mm) to 1" (25.4 mm) and be consistent across elevations, except at sink locations.
2	2					Coordination of such is the responsibility of the cabinet manufacturer.
3						**COUNTERTOPS** will be of maximum available and/or practical lengths, and:
3	1					Installed within 1/4" (6.4 mm) plus or minus the industry standard for height specified (see Section 10), except where ADA compliance is required.
3	2					**SECURELY FASTENED** and tightly fitted with flush joints and consistent joinery throughout the project, and:
3	2	1				Material supplier's recommended, water resistant, clear or color compatible **CAULK** and **SEALANTS** will be furnished and used by the installer to achieve the best performance.
3	2	2				At wall mounted splash, joint between splash and countertop will be caulked so as to leave a visible bead not exceeding 1/8" (3.2 mm) measured vertically or horizontally.
3	2	3				Flat countertops, except those of epoxy resin or natural / engineered stone, will be fit to the vertical surfaces and caulked so that the bead does not exceed 3/16" (4.7 mm) when measured vertically or horizontally, except at:
3	2	3	P	**Premium Grade**		It shall not exceed 1/8" (3.2 mm).
3	2	4				Flat countertops, of epoxy resin or natural / engineered stone, will be caulked to the vertical surfaces with a bead not to exceed 5/16" (7.9 mm) when measured vertically or horizontally.
3	2	5				Splash, except those of CGS Compact Laminate, epoxy resin or natural / engineered stone, will be fit to the vertical surfaces and caulked so that the bead does not exceed 3/16" (4.7 mm) when measured vertically or horizontally, except at:
3	2	5	P	**Premium Grade**		It shall not exceed 1/8" (3.2 mm).
3	2	6				Splash, of CGS Compact Laminate, epoxy resin or natural / engineered stone, will be caulked to the vertical surfaces with a bead not to exceed 5/16" (7.9 mm) when measured vertically or horizontally.
3	3					**CUTOUTS** in countertops, sub-tops or supports subject to moisture will have edges sealed with a color toned (for verification), water resistant sealer, except:
3	3	1				Materials of Solid surface, CGS (compact laminate), Epoxy, Natural and Engineered Stone.
4						**EDGE OVERHANGS** will be consistent, within a minimum of 1/2" (12.7 mm) and a maximum of 1-1/4" (31.8 mm) over the outer most cabinet face and finished end, parallel with the cabinet face or end within +/- 1/8" (3.2 mm) in any 96" (2440 mm) run of countertop, and:
4	1					At appliance ends, be flush to a maximum of 1/4" (6.4 mm) over the cabinet end.
4	2					If specified, a continuous drip groove 1/8" x 1/8" (3.2 mm x 3.2 mm), approximately 3/8" (9.5 mm) back from the front edge, will be provided.
4	3					If specified flush, will not exceed 1/8" (3.2 mm) over the outer most cabinet face and finished end, and be parallel with the cabinet face or end within +/- 1/16" (1.6 mm) in any 96" (2440 mm) run of countertop.

Continued on next page

SUGGESTION

14.11 SECTION 11 (Countertops & Horizontal Surfaces) - INSTALLATION REQUIREMENTS

Continued from previous page

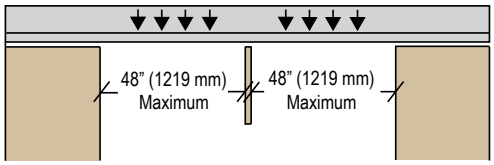
5 **SPANS** and **CANTILEVERS** of countertops will be reinforced to prevent deflection, and:

5 **1** **SPANS** will be reinforced to prevent deflection under a 50 lb. (22.7 kg) per square foot (kgs. per 305 mm square) load in any 48" (1220 mm) span or portion thereof, at:

5 1 **1** **WOOD, HPL** and **CGS** (Compact Laminate) in excess of 1/4" (6.4 mm).

5 1 **2** **SOLID SURFACE, EPOXY RESIN** and **NATURAL** or **ENGINEERED STONE in excess of 1/16" (1.6 mm).**

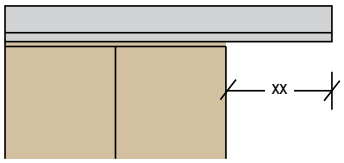
5 **2** SPANS such as,



will not exceed 48" (1220 mm) in width unsupported by cabinets or brackets/support, and:

5 2 **1** Brackets / support will prevent defection under a 50 lbs. (22.7 kg) per square foot (kgs. per 305 mm square) load in any 48" (1220 mm) span or portion thereof in excess of 1/16" (1.6 mm).

5 **3** **CANTILEVERS**, with or without a sub-top, such as,



will not exceed from a support, whether in the front, back, or end at:
- Wood or HPL, 12" (305 mm)
- Solid Surface 6" (152 mm) for 1/2" (12.7 mm) or 12" (305 mm) for 3/4" (19.0 mm) material thickness.
- CGS (Compact Laminate) 6" (152 mm) for 1/2" (12.7 mm), 12" (305 mm) for 3/4" (19.0 mm) or 18" (457 mm) for 1" (25.4 mm) material thickness.
- Epoxy Resin, 6" (152 mm) for 3/4" (19.0 mm) or 12" (305 mm) for 1" (25.4 mm) material thickness.
- Natural or Engineered Stone, 6" (152 mm) for 2CM (13/16" (20 mm) or 10" (254 mm) for 3CM (1-3/16" (30.2 mm)) material thickness.

6 **SOLID** or **VENEERED WOOD COUNTERTOPS** requires:

6 **1** **INSTALLER ASSEMBLED JOINTS** will be glued and fastened together with a mechanical tightening system either routed into or mounted on the bottom side of the countertop.

6 **2** **PERIMETER** of countertop to withstand a 75 lb. (34 kg) pull up pressure.

6 **3** Sink cutouts will not fall within 18" (457 mm) of discretionary installer joints.

7 **HPL COUNTERTOPS** will be properly aligned with uniform front edge overhang, scribed to walls and securely anchored to base cabinets with proper length screws, and requires:

7 **1** **INSTALLER ASSEMBLED JOINTS** will be glued and fastened together with a mechanical tightening system either routed into or surface mounted on the bottom side of the countertop.

7 **2** Perimeter of countertop to withstand a 75 lb. (34 kg) pull up pressure.

7 **3** Sink cutouts will not fall within 18" (457 mm) of discretionary installer joints.

Continued on next page

14.11 SECTION 11 (Countertops & Horizontal Surfaces) - INSTALLATION REQUIREMENTS

Continued from previous page

8	**SOLID SURFACE** will conform to the material supplier's recommendations, and requires:			
8	**1**	**SEALANTS** and **ADHESIVES** will be compatible with the individual material supplier's recommendations or specially developed sealants to achieve the best color match.		
8	**2**	**EXPANSION** joints will be furnished where required by building design or material supplier recommendations.		
8	**3**	**SUPPORT** will be adequately furnished to minimize stresses, and:		
8	3	**1**	Minimum full perimeter and joint support is required on horizontal applications, with:	
8	3	1	**1**	Maximum on center separation between supports of 30" (750 mm) for acrylic and 24" (610 mm) for non-acrylic materials.
8	3	1	**2**	A maximum unsupported and unloaded overhang of 12" (305 mm) for 3/4" (19.0 mm) and 6" (152 mm) for 1/2" (12.7 mm) sheet thickness.
8	**4**	**FIELD JOINTS** will be precision-machined, reinforced and glued with the material supplier's hard seaming material or equal, fully supported, joined straight, smooth, gap free and clean, and:		
8	4	**1**	**"L"** and **"U"** shaped inside corners will be rounded / radiused and smooth.	
8	**5**	**CUTOUTS** at heat producing areas, will have corners reinforced per the material supplier's requirements and protected with approved heat reflective tape.		
8	**6**	**BACK** and **END SPLASHES,** will be securely adhered to the wall, butt joined to the countertop, and coved splashes, when specified, will be hard seamed and integral to the countertop.		
8	**7**	**COUNTERTOP ADHESION** will be made using a clear silicone sealant placed a maximum of 12" (12.7 mm) on center.		
9	**CGS** (Compact Laminate), requires:			
9	**1**	**COUNTERTOP** will be secured to supports with silicone adhesive or appropriately sized machine screws applied to each corner and along the perimeter edge at not more than 48" (1220 mm) on center.		
9	**2**	**JOINTS** will be precision machined with tight joint fasteners and sealed with a biocide silicone prior to tightening.		
9	**3**	**SINKS** will be stainless steel, polypropylene, or epoxy resin; either lipped or under mount, and:		
9	3	**1**	**LIPPED** will be set in a rabbeted cutout in the countertop.	
9	3	**2**	**UNDER MOUNT** will be installed using adjustable metal sink supports for underside installation or fastened directly to the underside of the countertop using machine screws and silicone adhesive.	
9	3	**3**	A biocide silicone adhesive will be used at the juncture of the sink and countertop to produce a leak proof joint.	
9	**4**	**BACK** and **END SPLASHES** will be securely adhered to the wall, butt joined to the countertop.		

Continued on next page

14.11 SECTION 11 (Countertops & Horizontal Surfaces) - INSTALLATION REQUIREMENTS

Continued from previous page

10	**EPOXY RESIN, NATURAL / ENGINEERED STONE,** requires:				
10	1	**COUNTERTOP** will be secured to supports with epoxy cement applied to each corner and along the perimeter edge at not more than 48" (1220 mm) on center, and joints will be butted and filled with a color matched epoxy cement.			
10	2	**EDGE OVERHANG** will be provided on the front and ends of 1" (25.4 mm) nominal.			
10	3	**BACK** and **END SPLASHES** will be securely adhered to the wall, butt-joined to the countertop.			
10	4	**HARD SEAMS** will be water-tight and gap free.			
10	5	**SCRIBING** is not required.			
10	6	**SINKS** will be either lipped or under mounted, and:			
10	6	1	At **EPOXY RESIN,** lipped sinks will be set in a rabbeted cutout in the countertop.		
10	6	2	**UNDER MOUNT** will be installed using adjustable metal sink supports, and:		
10	6	2	1	An epoxy cement is required at the juncture of the sink and countertop to produce a leak proof joint.	
10	6	2	2	The maximum gap between the countertop edge of the sink and underside of the countertop will not exceed 3/16" (4.8 mm).	
10	7	**CANTILEVERED OVERHANGS**, with or without a sub top, will not exceed at:			
10	7	1	**EPOXY RESIN:** 6" (152 mm) for 3/4" (19.0 mm) thick, 12" (305 mm) for 1" (25.4 mm) thick, or 16" (406 mm) for 1-1/4" (31.8 mm) material thickness, whether in the front, back or end.		
10	7	2	**NATURAL / ENGINEERED STONE:** 6" (152 mm) for 2CM (3/16" (20 mm)) thick material or 10" (254 mm) for 3CM (1-1/8" (28.6 mm) material thickness, whether in the front, back or end.		

14.12 SECTION 12 (Historic Restoration Work) - INSTALLATION REQUIREMENTS

1	**MATCH** of **EXISTING** installation methods is required, in compliance with Sections 03 - 11, as applicable.
2	Where new materials are required to be distressed to blend seamlessly with original, mock-ups will be approved by the design professional or conservator before proceeding.

END OF SECTION 14