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USACE / NAVFAC / AFCEA / NASA UFGS-06 20 00 (August 2008)

Preparing Activity: NAVFAC Superceeding  
UFGS-06 20 00 (April 2008)

## UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated October 2009

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### SECTION 06 20 00

#### FINISH CARPENTRY 08/08

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NOTE: This guide specification covers general exterior and interior finish carpentry.

Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable items(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments and suggestions on this specification are welcome and should be directed to the technical proponent of the specification. A listing of the technical proponents, including their organization designation and telephone number, is on the Internet.

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NOTE: On the drawings, show:

1. Location, size, type, and thickness of materials;
2. Size and spacing of fasteners;
3. Details of millwork;
4. Color and/or pattern of prefinished material;
5. Profile and size of trim; and
6. Species of any wood that is to be stain, natural, or transparent finish.

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## PART 1   GENERAL

### 1.1   REFERENCES

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NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a RID outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN HARDBOARD ASSOCIATION (AHA)

AHA A135.6 (1998) Hardboard Siding

AMERICAN LUMBER STANDARDS COMMITTEE (ALSC)

ALSC PS 20 (1970) American Softwood Lumber Standard

AMERICAN WOOD PROTECTION ASSOCIATION (AWPA)

AWPA C20 (2003) Structural Lumber Fire-Retardant Treatment by Pressure Processes

AWPA C27 (2002) Plywood - Fire-Retardant Treatment by Pressure Processes

AWPA M2 (2007) Standard for Inspection of Treated Wood Products

AWPA M4 (2002) Standard for the Care of Preservative-Treated Wood Products

AWPA P5 (2009) Standard for Waterborne Preservatives

APA - THE ENGINEERED WOOD ASSOCIATION (APA)

APA E445S (2001; R 2002) Performance Standards and Qualification Policy for Structural-Use Panels (APA PRP-108)

APA PS 1 (1995) Voluntary Product Standard for Construction and Industrial Plywood

APA PS 2 (2004) Voluntary Product Standard for

## Wood-Based Structural-Use Panels

### ARCHITECTURAL WOODWORK INSTITUTE (AWI)

AWI Qual Stds (8th Edition) AWI Quality Standards

### ASME INTERNATIONAL (ASME)

ASME B18.2.1 (1996; Addenda A 1999; Errata 2003; R 2005) Square and Hex Bolts and Screws (Inch Series)

ASME B18.2.2 (1987; R 2005) Standard for Square and Hex Nuts

ASME B18.6.1 (1981; R 2008) Wood Screws (Inch Series)

### ASTM INTERNATIONAL (ASTM)

ASTM D 2898 (2008e1) Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing

ASTM F 547 (2006) Nails for Use with Wood and Wood-Base Materials

### BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (BHMA)

BHMA A156.9 (2003) Cabinet Hardware

### COMPOSITE PANEL ASSOCIATION (CPA)

CPA A208.1 (2009) Medium Density Fiberboard (MDF) For Interior Applications

### HARDWOOD PLYWOOD AND VENEER ASSOCIATION (HPVA)

HPVA HP-1 (2004) American National Standard for Hardwood and Decorative Plywood

### NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA LD 3 (2005) Standard for High-Pressure Decorative Laminates

### NATIONAL HARDWOOD LUMBER ASSOCIATION (NHLA)

NHLA Rules (2003) Rules for the Measurement & Inspection of Hardwood & Cypress

### NORTHEASTERN LUMBER MANUFACTURERS ASSOCIATION (NELMA)

NELMA Grading Rules (2003) Standard Grading Rules for Northeastern Lumber

### REDWOOD INSPECTION SERVICE (RIS) OF THE CALIFORNIA REDWOOD ASSOCIATION (CRA)

RIS Grade Use (1998) Redwood Lumber Grades and Uses

SOUTHERN PINE INSPECTION BUREAU (SPIB)

SPIB 1003 (2002) Standard Grading Rules for Southern Pine Lumber

U.S. DEPARTMENT OF COMMERCE (DOC)

DOC FED PS58 (1974) Basic Hardboard

WEST COAST LUMBER INSPECTION BUREAU (WCLIB)

WCLIB 17 (2000) Standard Grading Rules

WESTERN WOOD PRODUCTS ASSOCIATION (WWPA)

WWPA G-5 (1998) Western Lumber Grading Rules

WINDOW AND DOOR MANUFACTURERS ASSOCIATION (WDMA)

WDMA I.S. 4 (2000) Water-Repellent Preservative Non-Pressure Treatment for Millwork

WOOD MOULDING AND MILLWORK PRODUCERS ASSOCIATION (WMPMA)

WMPMA WM 6 (1987) Industry Standard for Non-Pressure Treating of Wood Millwork

1.2 SUBMITTALS

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NOTE: Review submittal description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

Choose the first bracketed item for Navy, Air Force  
and NASA projects, or choose the second bracketed  
item for Army projects.

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Government approval is required for submittals with a "G" designation;  
submittals not having a "G" designation are for [Contractor Quality Control  
approval.] [information only. When used, a designation following the "G"  
designation identifies the office that will review the submittal for the  
Government.] The following shall be submitted in accordance with Section  
01 33 00 SUBMITTAL PROCEDURES:

#### SD-02 Shop Drawings

##### Detail Drawings

#### SD-03 Product Data

Siding; [\_\_\_\_], [\_\_\_\_]

Epoxy-Aggregate Panels; [\_\_\_\_], [\_\_\_\_]

Manufacturer's printed data, showing texture, density, catalog  
cuts, and installation instructions.

Wood Items, Siding, and Trim; [\_\_\_\_], [\_\_\_\_]

Manufacturer's printed data indicating the usage of engineered  
or recycled wood products, and environmentally safe preservatives.

#### SD-04 Samples

Siding; [\_\_\_\_], [\_\_\_\_]

Wood Shingles; [\_\_\_\_], [\_\_\_\_]

Moldings; [\_\_\_\_], [\_\_\_\_]

Fascias and Trim; [\_\_\_\_], [\_\_\_\_]

Samples shall be of sufficient size to show patterns, color  
ranges, and types, as applicable, of the material proposed to be  
used.

#### SD-07 Certificates

Certificates of grade

Certificates of compliance

### 1.3 DETAIL DRAWINGS

The Contractor shall submit detail drawings showing fabricated items and  
special mill and woodwork items. Drawings shall indicate materials and  
details of construction, methods of fastening, erection, and installation.

### 1.4 CERTIFICATES

Provide certificates of grade from the grading agency on graded but



unmarked lumber or plywood attesting that materials meet the grade requirements specified herein.

Provide [certificates of compliance](#) unless materials bear certification markings or statements.

## 1.5 DELIVERY, STORAGE, AND HANDLING

Deliver lumber, plywood, trim, and millwork to job site in an undamaged condition. Stack materials to ensure ventilation and drainage. Protect against dampness before and after delivery. Store materials under cover in a well-ventilated enclosure and protect against extreme changes in temperature and humidity. Do not store products in building until wet trade materials are dry.

## 1.6 QUALITY ASSURANCE

### 1.6.1 Lumber

Identify each piece or each bundle of lumber, millwork, and trim by the grade mark of a recognized association or independent inspection agency that is certified by the Board of Review, American Lumber Standards Committee, to grade the species.

### 1.6.2 Plywood

Each sheet of plywood shall bear the mark of a recognized association or independent inspection agency that maintains continuing control over quality of the plywood. Mark shall identify plywood by species group or span rating, and shall show exposure durability classification, grade, and compliance with [APA PS 1](#).

### 1.6.3 Hardboard [and Particleboard]

Materials shall bear a marking or statement identifying the producer and the applicable standard.

### 1.6.4 Pressure-Treated Lumber and Plywood

Each treated piece shall be inspected in accordance with [AWPA M2](#).

### 1.6.5 Nonpressure-Treated Woodwork and Millwork

Mark, stamp, or label, indicating compliance with [WDMA I.S. 4](#).

### 1.6.6 Fire-Retardant Treated Lumber

Each piece to bear Underwriters Laboratories label or the label of another nationally recognized independent testing laboratory.

## PART 2 PRODUCTS

### 2.1 WOOD

#### 2.1.1 Sizes and Patterns of Wood Products

Yard and board lumber sizes shall conform to [ALSC PS 20](#). Provide shaped lumber and millwork in the patterns indicated and standard patterns of the association covering the species. Size references, unless otherwise

specified, are nominal sizes, and actual sizes shall be within manufacturing tolerances allowed by the applicable standard.

## 2.1.2 Trim, Finish, and Frames

Provide species and grades listed for materials to be paint finished. Provide materials that are to be stain, natural, or transparent finished one grade higher than that listed. Provide species indicated for materials to be transparent finished. Run trim, except window stools and aprons with hollow backs.

\*\*\*\*\*  
**NOTE: Edit table to delete unsuitable species. For small projects, species that are not readily available locally may be deleted.**  
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TABLE OF GRADES FOR WOOD TO RECEIVE PAINT FINISH

<u>Grading Rules</u>	<u>Species</u>	<u>Exterior and Interior Trim, Finish, and Frames</u>
WWPA G-5 grading rules	Aspen Douglas Fir-Larch Douglas Fir-South Engelmann Spruce -Lodgepole Pine Engelmann Spruce Hem-Fir Idaho White Pine Lodgepole Pine Mountain Hemlock Mountain Hemlock -Hem-Fir Ponderosa Pine- Sugar Pine (Ponderosa Pine -Lodgepole Pine) White Woods (Western Woods) Western Cedars Western Hemlock	All Species: C & Btr. Select (Choice & Btr Idaho White Pine) or Superior Finish. Western Red Cedar may be graded C & Btr. Select or A & Btr. per Special Western Red Cedar Rules.
WCLIB 17 standard grading rules	Douglas Fir-Larch Hem-Fir Mountain Hemlock Sitka Spruce Western Cedars Western Hemlock	All Species: C & Btr VG, except A for Western Red Cedar
SPIB 1003 grading rules	Southern Pine	C & Btr
NHLA Rules	Cypress	C-Select
NELMA Grading Rules standard grading rules	Balsam Fir Eastern Hemlock- Tamarack	All Species: C- Select except C & Btr for Eastern White

TABLE OF GRADES FOR WOOD TO RECEIVE PAINT FINISH

<u>Grading Rules</u>	<u>Species</u>	<u>Exterior and Interior Trim, Finish, and Frames</u>
	Eastern Spruce	Pine and Norway Pine
	Eastern White Pine	
	Norway Pine	
	Northern Pine	
	Northern White Cedar	
 RIS Grade Use standard specifications	 Redwood	 Clear Clear All Heart
 NHLA Rules rules	 Cypress	 B Finish
	Red Gum	Select or Btr
	Soft Elm	(for interior use only)
	Birch	

#### 2.1.3 Utility Shelving

Utility shelving shall be a suitable species equal to or exceeding requirements of No. 3 Common white fir under WWPA G-5, 25 mm 1 inch thick; or plywood, interior type, Grade A-B, 13 mm (1/2 inch) 1/2 inch thick, any species group.

#### 2.1.4 Softwood Plywood

APA PS 1, thicknesses as indicated.

- a. Plywood for Soffits: Exterior type, B-B medium density overlay.
- b. Plywood for Shelving: Interior type, [A-B] [B-B] Grade, any species group.
- c. Plywood for Countertops: Exterior type, A-C Grade.

#### 2.1.5 Hardwood Plywood

\*\*\*\*\*  
**NOTE: Retain bracketed option describing core  
 construction if only hardwood veneer or lumber core  
 construction is acceptable.**  
 \*\*\*\*\*

HPVA HP-1, Type [Technical (Exterior)] [I (Exterior)] [II (Interior)] [III (Interior)], [Premium (A)] [Good (1)] [Sound (2)] [Utility (3)] [Backing (4)] [Specialty (SP)] Grade, [hardwood veneer core construction,] [lumber core construction,] face veneers of [\_\_\_\_], of thickness indicated.

#### 2.1.6 Hardboard

DOC FED PS58, [standard] [tempered] [service] type, [3] [6] mm [1/8] [1/4] inch thick.

#### [2.1.7 Particleboard

\*\*\*\*\*  
NOTE: Particleboard is considered inferior by some  
and is prohibited in many areas. Verify before  
using.  
\*\*\*\*\*

CPA A208.1, Grade 1-M-2 or 2-M-2 or better.

#### ]2.1.8 Stairs

Treads 32 mm 1 1/4 inches thickness, clear red or white oak. Risers 19 mm  
one inch nominal finish lumber.

#### 2.1.9 Shoe Mold

Clear red or white oak, 13 by 16 mm 1/2 by 5/8 inch unless otherwise  
indicated.

#### 2.1.10 Wood Seats

Clear maple, oak, or other suitable hardwood, not less than 40 mm 1 5/8  
inches thick, with rounded edges. Provide stainless steel stanchions or  
brackets [as indicated].

#### 2.1.11 Wood Bumpers

Clear oak [, maple] [, birch] [or] [\_\_\_\_\_], dressed to size indicated and  
with outer edges beveled.

#### 2.1.12 Catwalks

Boards, 19 by 140 mm one by 6 inches nominal, species and grade equal to or  
exceeding 3 Common Hem-Fir under WHPA G-5.

#### 2.1.13 Siding

Horizontal siding shall be hardboard, plywood, or wood. Panel siding shall  
be hardboard or plywood.

##### 2.1.13.1 Horizontal Hardboard Siding

AHA A135.6, factory primed face and longitudinal edges, factory sealed  
back, lap type, [200] [225] [250] [300] millimeters (mm) [8] [9] [10] [12]  
inches wide, maximum practicable lengths, 9.5 or 11 mm 3/8 or 7/16 inch  
thick, [smooth] [embossed] [textured] face.

##### 2.1.13.2 Panel Hardboard Siding

AHA A135.6, factory primed face and longitudinal edges, factory sealed back,  
1220 mm 4 feet wide, maximum practicable lengths, 9.5 or 11 mm 3/8 or 7/16  
inch thick, [smooth] [embossed] face [, and grooved as selected from  
manufacturer's standard patterns].

##### 2.1.13.3 Horizontal Plywood Siding

APA PS 1, exterior, [medium-density overlay] lap type, [150] [200] [300] mm  
[6] [8] [12] inches wide, maximum practicable lengths, [9.5] [11] [12] [13]

mm [3/8] [7/16] [15/32] [1/2] inch thick, [smooth] [embossed] [rough-sawn texture] [embossed] face.

#### 2.1.13.4 Panel Plywood Siding

APA PS 1, exterior, [medium-density overlay,] 1220 mm 4 feet wide, maximum practicable lengths, span rating of [400] [600] mm [16] [24] oc, [smooth] [embossed] [rough-sawn texture] [striated] face, [and grooved] as selected from manufacturer's standard patterns.

#### 2.1.13.5 Horizontal Rated Siding

Qualified under APA E445S, exterior type [medium-density overlay], lap types, [150] [200] [250] [300] mm [6] [8] [10] [12] inches wide, maximum practicable lengths, [11] [12] [13] mm [7/16] [15/32] [1/2] inch thick, [smooth] [embossed] [rough-sawn texture] face.

#### 2.1.13.6 Panel Rated Siding

Qualified under APA E445S, exterior type, [medium-density overlay] 1220 mm 4 feet wide, maximum practicable lengths, [span rated at 400 mm 16 oc] [span rated at 600 mm 24 oc,] [smooth] [embossed] [striated] face [, and grooves] as selected from manufacturer's standard patterns.

#### 2.1.13.7 Wood Siding

Species and grades listed in paragraph entitled "Trim, Finish, and Frames" Table. Siding shall be [horizontal bevel type, minimum 5 mm 3/16 inch thin edge by minimum 11 mm 7/16 inch thick edge,] [horizontal plain lap type] [horizontal drop type] [vertical board, tongue and groove or shiplap on long edges,] [vertical board and batten type,] 25 mm one inch thick, [150] [200] [250] mm [6] [8] [10] inches wide, maximum practicable lengths, [smooth] [rough-sawn texture].

#### 2.1.13.8 Wood Structural Panels

Wood Structural Panels shall conform to APA PS 2, exterior, exposure [1] [2], [single-faced] [double-faced], 1200 mm 4 feet wide, maximum practicable lengths, selected from manufacturer's standard patterns to satisfy the wind load for the specified span.

#### 2.1.13.9 Epoxy-Aggregate Panels

\*\*\*\*\*  
NOTE: Epoxy-aggregate coated panels may be included  
in the design for architectural purposes and then  
only as accent and spandrel panels. If not included  
in the design, delete this information.  
\*\*\*\*\*

Prefinished epoxy-aggregate panels shall consist of an asbestos-free cement board base sheet with a factory applied surface of epoxy resins and decorative natural stone chips. Factory applied finish shall be a minimum of 0.5 mm 20 mils of 100 percent solids, two-component epoxy resin-based coating followed by an application of inert aggregate. Stone color shall be selected from manufacturer's standard colors. Cement board base sheet shall be a minimum of 6 mm 1/4 inch thick. Finished panels shall be dimensionally stable. Water absorption on the surfaced side shall not exceed 0.20 percent after 24 hours of submergence in water. Accessories

shall be manufacturer's standard extruded matching color aluminum moldings. Moldings shall be provided for meeting strips, end caps, inside corners, or outside corners. Fasteners shall be noncorrosive, self-tapping screw type and finished to match the color of stone. Caulking compound shall be color compatible, low modulus silicone or urethane type.

## 2.2 SOFFITS

### 2.2.1 Hardboard and Plywood

Hardboard and plywood soffits shall be siding grade hardboard, 10 or 11 mm (3/8 or 7/16 inch) 3/8 or 7/16 inch thick; plywood, APA PS 1, exterior type, [Grade A-C] [plywood panel siding] [rated siding], [9 mm (11/32 inch) 11/32 inch thick for 600 mm 24 inch on centers] [12 mm (15/32 inch) 15/32 inch thick for 800 mm 32 inch on centers] [15 mm (19/32 inch) 19/32 inch thick for 1200 mm 48 inch on centers] maximum span with all edges supported.

## 2.3 FASCIAS AND TRIM

### 2.3.1 Wood

Fascias and trim, including exterior door and window casing, shall be species and grade listed in TABLE I at the end of this section. Sizes shall be as indicated. Metal corners may be furnished in lieu of wood cornerboards for horizontal siding; and if furnished, shall be galvanized steel and primed or aluminum and primed.

## 2.4 WOOD SHINGLES

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NOTE: Selection of wood shingles will be based on climatic conditions at the job site. Besides fire resistance, factors to be considered are: wind, fungus, rot and termite resistance plus tear strength and whether the shingles are sealing or not.  
\*\*\*\*\*

Wood shingles shall be No. 1 Grade, Red Cedar, Tidewater Red Cypress or California Redwood in accordance with applicable grading rules under which it is produced, random widths, [400] [450] [600] mm [16] [18] [24] inches length, dip-stained at factory in color selected from manufacturer's standard colors. Wood shingles shall be fire-retardant treated as indicated.

## 2.5 COUNTER TOPS

### 2.5.1 Laminated Plastic

NEMA LD 3.

#### 2.5.1.1 Countertop Finish

Grade GP 50 or PF 42, satin finish. Color and pattern shall be [\_\_\_\_\_] [as indicated].

#### 2.5.1.2 Backing Sheet

BK 20.

## 2.5.2 Solid Surface

Manufactured from homogeneous solid sheets for filled plastic resin complying with materials and performance requirements of ANSI Z 124.3, for Type 5 or Type 6, without a precoated finish.

## 2.6 MOISTURE CONTENT OF WOOD PRODUCTS

Air-dry or kiln-dry lumber. Kiln-dry treated lumber after treatment. Maximum moisture content of wood products at time of delivery to the job site, and when installed, shall be as follows:

\*\*\*\*\*  
NOTE: At the text below, the lower percentages (6 and 8 percent) may be specified for interior woodwork which will be located in spaces which will be dry due to heating and air conditioning.  
\*\*\*\*\*

- a. Interior Paneling: [6] [12] percent.
- b. Interior Finish Lumber, Trim, and Millwork 25 mm 1 1/4 Inches Nominal or Less in Thickness: [6] [12] percent on 85 percent of the pieces and [8] [15] percent on remainder.
- c. Exterior Treated and Untreated Finish Lumber and Trim 89 mm 4 Inches Nominal or Less in Thickness: 19 percent.
- d. Exterior Wood Siding: 15 percent.
- e. Moisture content of other materials shall be in accordance with the applicable standards.

## 2.7 PRESERVATIVE TREATMENT OF WOOD PRODUCTS

### 2.7.1 Nonpressure Treatment

Treat woodwork and millwork, such as exterior trim, door trim, and window trim, in accordance with WDMA I.S. 4, with either 2 percent copper naphthenate, 3 percent zinc naphthenate, or 1.8 percent copper-8-quinolinolate. Provide a liberal brushcoat of preservative treatment to field cuts and holes.

### 2.7.2 Pressure Treatment

Lumber and plywood used on the exterior of buildings [or in contact with masonry or concrete] shall be treated with water-borne preservative listed in AWPA P5 as applicable, and inspected in accordance with AWPA M2. Identify treatment on each piece of material by the quality mark of an agency accredited by the Board of Review of the American Lumber Standards Committee. Plywood shall be treated to a reflection level as follows:

Exterior wood molding and millwork within 455 mm 18 inches of soil, in contact with water or concrete shall be preservative-treated in accordance with WMPA WM 6. Exposed areas of treated wood that are cut or drilled after treatment shall receive a field treatment in accordance with AWPA M4. Items of all-heart material of cedar, cypress, or redwood will not require preservative treatment, except when in direct contact with soil.

## 2.8 FIRE-RETARDANT TREATMENT

\*\*\*\*\*  
NOTE: List items to be treated in this paragraph.  
If fire-retardant treatment is not required, delete  
this paragraph and the following subparagraph.  
Specify fire-retardant treated plywood only for  
nonstructural applications not subject to elevated  
temperatures or high humidity. Do not specify  
fire-retardant treated plywood for any part of the  
roof or roofing system.  
\*\*\*\*\*

### 2.8.1 Wood Products

Fire-retardant treated lumber shall be pressure treated in accordance with [AWPA C20](#). Fire-retardant treated plywood shall be pressure treated in accordance with [AWPA C27](#). Material use shall be defined in [AWPA C20](#) and [AWPA C27](#) for Interior Type [A] [and] [B] and Exterior Type. Treatment and performance inspection shall be by a qualified independent testing agency that establishes performance ratings. Each piece or bundle of treated material shall bear identification of the testing agency to indicate performance with such rating. Treated materials to be exposed to rain wetting shall be subjected to an accelerated weathering technique in accordance with [ASTM D 2898](#), Method A, prior to being tested for compliance with [AWPA C20](#) or [AWPA C27](#).

Treat the following items:

- a. [\_\_\_\_\_].

## 2.9 HARDWARE

Provide sizes, types, and spacings of manufactured building materials recommended by the product manufacturer except as otherwise indicated or specified.

### 2.9.1 Wood Screws

[ASME B18.6.1](#).

### 2.9.2 Bolts, Nuts, Lag Screws, and Studs

[ASME B18.2.1](#) and [ASME B18.2.2](#).

### 2.9.3 Nails

Nails shall be the size and type best suited for the purpose and shall conform to [ASTM F 547](#). Nails shall be hot-dip galvanized or aluminum when used on exterior work. For siding, length of nails shall be sufficient to extend 40 mm 1-1/2 inches into supports, including wood sheathing over framing. Screws for use where nailing is impractical shall be size best suited for purpose.

### 2.9.4 Adjustable Shelf Standards

\*\*\*\*\*  
NOTE: See BHMA A156.9 for types of hardware  
available.



\*\*\*\*\*

BHMA A156.9, Type [\_\_\_\_], with shelf rests Type [\_\_\_\_].

#### 2.9.5 Vertical Slotted Shelf Standards

\*\*\*\*\*

**NOTE: See BHMA A156.9 for types of hardware available.**

\*\*\*\*\*

BHMA A156.9, Type [\_\_\_\_], with shelf brackets Type [\_\_\_\_].

#### 2.9.6 Closet Hanger Rods

Chromium-plated steel rods, not less than 25 mm one inch diameter by 1.3 mm thick 18 gage. Rods may be adjustable with integral mounting brackets if smaller tube is 25 mm one inch by 1.3 mm thick 18 gage. Provide intermediate support bracket for rods more than 1200 mm 48 inches long.

### 2.10 FABRICATION

#### 2.10.1 Quality Standards (QS)

\*\*\*\*\*

**NOTE: Include this paragraph only if AWI QS will be referenced in the text of this section. See paragraph entitled "Casework with Transparent Finish (CTF)," for an example of such a reference. See AWI QS for additional examples, and for definitions of quality grades.**

\*\*\*\*\*

The terms "Premium," "Custom," and "Economy" refer to the quality grades defined in AWI Qual Stds. Items not specified to be of a specific grade shall be Custom grade. The AWI QS is superseded by all contract document requirements indicated or stated herein.

#### 2.10.2 Countertops

\*\*\*\*\*

**NOTE: Use a plastic laminate backing sheet for counters exposed to excessive moisture.**

\*\*\*\*\*

Fabricate with lumber and a core of [exterior plywood] [or] [particleboard], glued and screwed to form an integral unit. Bond laminated plastic under pressure to exposed surfaces, using type of glue recommended by plastic manufacturer [, and bond a backing sheet under pressure to underside of countertop]. Countertop unit shall be post-formed type with no-drip nose, cove moulding, and Style A back splash, and covered with NEMA LD 3, Grade PF 42 plastic. Back splash shall be not less than 90 mm 3 1/2 inches nor more than 115 mm 4 1/2 inches high.

#### 2.10.3 Cabinets

Wall and base cabinets [and vanity cabinets] shall be of the same construction and appearances. Fabricate with solid ends and frame fronts, or with frames all around. Frames shall be solid hardwood not less than 19

by 38 mm 3/4 by 1 1/2 inches. Ends, bottom, back, partitions, and doors shall be hardwood plywood. Mortise and tenon, dovetail, or dowel and glue joints to produce a rigid unit. Cover exposed edges of plywood with hardwood strips. Doors, frames, and solid exposed ends shall be 19 mm 3/4 inch thick; bottom, partitions, and framed ends 13 mm 1/2 inch minimum; shelves 16 mm 5/8 inch minimum; back 6 mm 1/4 inch minimum.

#### 2.10.3.1 Cabinet Hardware

\*\*\*\*\*  
**NOTE: See BHMA A156.9 for types of hardware available. Edit this paragraph to include hardware items needed for custom millwork such as custom wood wardrobes.**  
\*\*\*\*\*

**BHMA A156.9.** Provide cabinet hardware including two self-closing hinges for each door, two side-mounted metal drawer slides for each drawer and pulls for all doors and drawers as follows. Hardware exposed to view shall be [bright chromium plated][\_\_\_\_][as indicated]. All cabinet hardware shall comply with the following requirements:

- a. Provide concealed Euro-Style, back mounted hinges with opening to 165 degrees with self-closing feature at less than 90 degrees to its closed position..

\*\*\*\*\*  
**NOTE: Static drawer slide capacity of 100 lbs444 N are appropriate for housing kitchens, vanities and light commercial construction. Specify a heavier capacity slide for more abusive situations or where heavier loading of drawers is anticipated.**  
\*\*\*\*\*

- b. Drawer slides shall have a static rating capacity of [100 lbs444 N][\_\_\_\_]. The slides shall have a self closing/stay-closed action, zinc or epoxy coated steel finish, ball bearing rollers, and positive stop with lift out design.
- c. Drawer pulls shall be [wire type pulls with center-to-center dimension not less than 3 1/2 inches89 mm and cross sectional diameter of 5/16 inch8 mm. The handle projection shall be not less than 1 5/16 inches33 mm.][\_\_\_\_][as indicated.].
- d. Drawer catch shall be heavy duty magnetic catch.

#### 2.10.3.2 Finish

Provide a natural factory finish on wood surfaces after fabrication. Finish shall be fabricator's standard natural finish, except that it shall be equivalent to one coat of sealer and one coat of spar varnish on all surfaces and a second coat of spar varnish on surfaces exposed to view. Sand lightly and wipe clean between coats.

#### 2.10.4 Workbenches

Fabricate as indicated. Dovetail and glue drawer corners. Fasten frames with suitable wood screws or bolts. Sand exposed surfaces smooth, and ease exposed edges. Provide two side-mounted, metal, ball-bearing drawer slides

[BHMA A156.9, Type [\_\_\_\_],] for each drawer, and at least two surface-mounted hinges [, Type [\_\_\_\_],] and a magnetic catch [, Type [\_\_\_\_],] for each door.

#### 2.10.5 Casework With Transparent Finish (CTF)

\*\*\*\*\*  
NOTE: This is a sample paragraph for referencing  
the AWI QS. See the standards for definitions of  
quality grades and for additional information on  
using the AWI QS.  
\*\*\*\*\*

##### 2.10.5.1 AWI Quality Grade (CTF)

[Premium] [Custom] [Economy] grade.

##### 2.10.5.2 Construction (CTF)

Details shall conform to [reveal overlay] [flush overlay] [exposed face frame] design.

##### 2.10.5.3 Exposed Parts

[\_\_\_\_] specie, [\_\_\_\_] cut.

##### 2.10.5.4 Semi-Exposed Parts

As specified in the AWI Qual Stds for the grade selected.

#### 2.10.6 Casework With High Pressure Laminate Finish (CHPL)

\*\*\*\*\*  
NOTE: This is a sample paragraph for referencing  
the AWI QS. See the standards for definitions of  
quality grades and for additional information on  
using the AWI QS.  
\*\*\*\*\*

##### 2.10.6.1 AWI Quality Grade (CHPL)

[Premium] [Custom] grade.

##### 2.10.6.2 Construction (CHPL)

Details shall conform to [reveal overlay] [flush overlay] [exposed face frame] design.

##### 2.10.6.3 Exposed Surfaces

High pressure laminate, color [\_\_\_\_], pattern [\_\_\_\_].

##### 2.10.6.4 Semi-Exposed Surfaces

As specified in the AWI Qual Stds for the grade selected.

## PART 3 EXECUTION

### 3.1 FINISH WORK

Provide sizes, materials, and designs as indicated and as specified. Apply primer to finish work before installing. Where practicable, shop assemble and finish items of built-up millwork. Joints shall be tight and constructed in a manner to conceal shrinkage. Miter trim and moldings at exterior angles and cope at interior angles and at returns. Material shall show no warp after installation. Install millwork and trim in maximum practical lengths. Fasten finish work with finish nails. Provide blind nailing where practicable. Set face nails for putty stopping.

#### 3.1.1 Exterior Finish Work

Machine-sand exposed flat members and square edges. Machine-finish semi-exposed surfaces. Construct joints to exclude water. In addition to nailing, glue joints of built-up items with waterproof glue as necessary for weather-resistant construction. Provide well distributed end joints in built-up members. Provide shoulder joints in flat work. Hold backs of wide-faced miters together with metal rings and waterproof glue. Fascias and other flat members, unless otherwise indicated, shall be 19 mm 3/4 inch thick. Provide door and window trim in single lengths. Provide braced, blocked, and rigidly anchored cornices for support and protection of vertical joints. Install soffits in largest practical size. Joints of plywood shall occur over center lines of supports. Fasten soffits with aluminum or stainless steel nails. Back prime all concealed surfaces of exterior trim.

#### 3.1.2 Interior Finish Work

After installation, sand exposed surfaces smooth. Provide window and door trim in single lengths.

#### 3.1.3 Door Frames

Set plumb and square. Provide solid blocking at not more than 400 mm 16 inches o.c. for each jamb. Position blocking to occur behind hinges and lock strikes. Double wedge frames and fasten with finishing nails. Set nails for putty stopping.

#### 3.1.4 Thresholds

Provide thresholds [shaped as indicated] [16 mm 5/8 inch thick by 70 mm 2 5/8 inches wide with beveled sides] and cut to fit at jambs. Fasten thresholds with casing nails. Set nails for putty stopping.

#### 3.1.5 Window Stools and Aprons

Provide stools with rabbet over window sill. Provide aprons with returns cut accurately to profile of member.

#### 3.1.6 Bases

Flat member with a molded top [and oak shoe mold]. Fasten base to framing or to grounds. [Nail shoe mold to the base.] Set [shoe mold] [one-piece wood base] after finish flooring is in place.

### 3.1.7 Finish Stair Work

Fit, nail, screw, bolt, and glue stair work together to form a strong rigid structure without squeaks or vibrations. Anchor newels and posts securely to rough stair framing. Cut newels, posts, and drops accurately around floor construction to make tight fit. Install balusters into treads and landings with glue. Install railing with straight runs following slope of stairs and with smooth curve turns. Return railing profile at ends and secure joints with bolts and nuts. Secure railing to posts and newels with concealed anchors. Support wall rails on metal brackets spaced near ends and not over 1500 mm 5 feet o.c.

### 3.2 SHELVING

19 mm one inch nominal thick wood shelf material or 19 or 20 mm 3/4 or 23/32 inch thick plywood shelf material supported substantially with end and intermediate supports and arranged to prevent buckling and sagging. [Hook strips shall be 19 by 89 mm one by 4 inches nominal and cleats 19 by 38 mm one by 2 inches nominal.] Provide cleats except where hook strips are specified or indicated. [Where adjustable shelving is indicated, provide standards and brackets or shelf rests for each shelf.] [Anchor standards to wall at not more than 600 mm 2 feet o.c.]

#### 3.2.1 Linen Closets

Unless indicated otherwise, linen closets shall have a counter shelf 500 mm 20 inches wide located 900 mm 36 inches above the floor, a lower shelf approximately 450 mm 18 inches wide and 450 mm 18 inches above the floor, and three upper shelves 285 mm 11 1/4 inches wide located 350 mm 14 inches above the counter shelf and 350 mm 14 inches apart.

#### 3.2.2 Storage Rooms

Provide storage rooms with shelves [of size and arrangement as indicated] [285 mm 11 1/4 inches wide, bottom shelf 450 mm 18 inches above the floor, top shelf 450 mm 18 inches below the ceiling, and intermediate shelves approximately 450 mm 18 inches apart].

#### 3.2.3 Room Closets

Provide two shelves 285 mm 11 1/4 inches wide. Support lower shelf by hook strips at back and ends, and provide full-length wood or metal clothes hanger rods unless indicated otherwise.

#### 3.2.4 Cleaning-Gear Closets

Provide [shelves of size and arrangement indicated] [two shelves 350 mm 14 inches wide].

### 3.3 CLOTHES HANGER RODS

Provide clothes hanger rods where indicated and in closets having hook strips. Set rods parallel with front edges of shelves and support by sockets at each end and by intermediate brackets spaced not more than 1200 mm 4 feet o.c.

### 3.4 MISCELLANEOUS

#### 3.4.1 Counters

Construct as indicated. Conceal fastenings where practicable, fit counter neatly, install in a rigid and substantial manner, and scribe to adjoining surfaces. Provide counter sections in longest lengths practicable; keep joints in tops to a minimum; and where joints are necessary, provide tight hairline joints drawn up with concealed-type heavy pull-up bolts. Glue joints with water-resistant glue and, in addition, make rigid and substantial with screws, bolts, or other approved fastenings.

#### 3.4.2 Cabinets

Install level, plumb, and tight against adjacent walls. Secure cabinets to walls with concealed toggle bolts, and secure top to cabinet with concealed screws. [Make cut-outs for fixtures to templates supplied by fixture manufacturer. Carefully locate cut-outs for pipes so that edges of holes will be covered by escutcheons.]

#### 3.4.3 Workbenches

Construct as indicated. Install level, plumb, and tight against adjacent construction. Fasten to walls with screws or toggle bolts and to floors with expansion bolts.

#### 3.4.4 Wood Seats

Support seats [on brackets spiked to the studs] [on stanchions] [as indicated]. Secure seats to supports with [screws] [bolts] as required; countersink heads of [screws] [bolts] and fill holes with hardwood filler, finished flush with tops of seats.

#### 3.4.5 Wood Bumpers

Bore, countersink, and bolt in place where indicated.

#### 3.4.6 Catwalks in Attic Spaces

Lay boards with 25 mm one inch spaces between. Stagger end joints, with each joint on a support.

### 3.5 SIDING

#### 3.5.1 Installation of Siding

Fit and position without springing or otherwise forcing into place. [For siding to have a stain finish, set nails and stop with nonstaining putty to match finished siding.] [For siding to have a paint finish, drive nails flush.]

#### 3.5.2 Horizontal Siding

\*\*\*\*\*  
NOTE: Only one nail at each support is used to  
attach 150 mm 6 inch or less wide siding. Edit last  
sentence accordingly.  
\*\*\*\*\*

Make end joints over framing members and alternate so at least two boards will be between joints on same support. Uniformly distribute shorter pieces throughout area. Provide starter strips to establish proper slant for siding. Predrill ends of siding if necessary to prevent splitting when nailed. [Horizontal bevel or plain lap siding: Overlap and nail into each support in accordance with recommendations of siding manufacturer.] [Horizontal drop siding: Work each course into top edge of previous course. Nail into each support with [two nails, one near lower edge to clear top of previous course, and one just above mid-height of course.] [one nail just above mid-height of course.]]

### 3.5.3 Vertical Board Siding

\*\*\*\*\*  
**NOTE: Only one nail at each support is used to  
attach 150 mm 6 inch or less wide siding. Edit last  
sentence accordingly.**  
\*\*\*\*\*

Apply siding with horizontal joints only at locations indicated. Work each board into edge of previous course. Nail into supports at 600 mm 24 inches on center with [two nails, one blind if possible at or near joint with previous board, and one just outside board centerline.] [one nail just outside board center line.]

### 3.5.4 Vertical Board and Batten Siding

Apply with horizontal joints only at locations indicated. Install each board with 13 mm 1/2 inch space between it and previous board. Nail at center of board and into supports at 600 mm 24 inches on center. Center battens over space between boards and nail down center at 400 mm 16 inches on center.

### 3.5.5 Panel Siding

Apply panels with edges at joints spaced in accordance with manufacturer's recommendations. Shiplapped edges or square edges covered with battens shall be [primed for paint finish,] [sealed for stain finish,]. Back all edges with framing members. Nail panels at edges 150 mm 6 inches on center and at intermediate supports 300 mm 12 inches on center. Edge nailing to be 10 mm 3/8 inch from edges. For shiplap joints, nail 10 mm 3/8 inch from visible joint and at a location to penetrate lap with previous panel. When panel siding is part of an engineered shear wall or used as wall-bracing, nail shiplap joints to supports with double rows of nails. Space battens at [300] [400] mm [12] [16] inches on center and nail down center at 600 mm 24 inches on center.

### 3.5.6 Epoxy-Aggregate Coated Panels

Panels shall be installed where shown. Installation shall be as recommended by the manufacturer of the panels.

## 3.6 SOFFITS

### 3.6.1 Wood

Panels shall be applied with edges at joints spaced in accordance with manufacturer's instructions and with all edges backed with framing members. Panels shall be nailed 10 mm 3/8 inch from edges at 150 mm 6 inches on

center and at intermediate supports at 300 mm 12 inches on center. Panels shall be installed using the maximum practical lengths.

### 3.7 FASCIAS AND EXTERIOR TRIM

Exposed surfaces and square edges shall be machine sanded, caulked, and constructed to exclude water. Joints of built-up items, in addition to nailing, shall be glued as necessary for weather-resistant construction. End joints in built-up members shall be well distributed. Joints in flat work shall be shouldered. Backs of wide-faced miters shall be held together with metal rings and glue. Fascias and other flat members shall be in maximum practicable lengths. Cornices shall be braced, blocked, and rigidly anchored for support and protection of vertical joints.

### 3.8 MOLDING AND INTERIOR TRIM

Molding and interior trim shall be installed straight, plumb, level and with closely fitted joints. Exposed surfaces shall be machine sanded at the mill. Molded work shall be coped at returns and interior angles and mitered at external corners. Intersections of flatwork shall be shouldered to ease any inherent changes in plane. Window and door trim shall be provided in single lengths. Blind nailing shall be used to the extent practicable, and face nailing shall be set and stopped with a nonstaining putty to match the finish applied. Screws shall be used for attachment to metal; setting and stopping of screws shall be of the same quality as required where nails are used.

### 3.9 WOOD SHINGLES

\*\*\*\*\*

NOTE: Weather exposure should be 190 mm (7-1/2 inches) for 400 mm (16 inch) shingles, 215 mm (8-1/2 inches) for 450 mm (18 inch) shingles, and 290 mm (11-1/2 inches) for 600 mm (24 inch) shingles. If roof slope is over 18 degrees, 330 mm per meter (4 in 12), exposure should be 125 mm (5 inch), 140 mm (5-1/2 inch), and 190 mm (7-1/2 inch) for the same length of shingles.

In snow areas the minimum recommended roof slope is 330 mm per meter (4 in 12); in non-snow areas is 300 mm per meter (3 in 12).

\*\*\*\*\*

Wood shingles shall be applied by single-coursing method and with a weather exposure of [190] [215] [290] mm. [7-1/2] [8-1/2] [11-1/2] inches. Each shingle shall be nailed with two nails 25 mm 1 inch above butt line of the next course, except shingles more than 200 mm 8 inches in width shall be nailed with three nails. Starter course shall be doubled, and vertical joints shall be offset from vertical joints of the previous course. Corners shall be [mitered over flashing] [abutted to a cedar or redwood strip at the corner] as indicated.

-- End of Section --