

**A P A**

*The Engineered Wood Association*

**P R O D U C T G U I D E**



# GRADES AND SPECIFICATIONS

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## INTRODUCTION

*This guide to APA – The Engineered Wood Association panel grades and specifications is meant to serve as a useful reference source for structural wood panel users, specifiers, dealers and distributors. It contains key information about the many structural wood panel grades produced by APA member mills, including APA Performance Rated Panels, sanded plywood, and specialty grades. It illustrates and explains APA trademarks. It provides a comprehensive guide to architectural specifications. And it contains panel installation recommendations for typical construction applications.*

*For complete panel application recommendations or additional product information, consult any of the other APA publications cited throughout this brochure.*

*Or for additional specification or design assistance, contact the nearest APA regional field office listed on the back cover.*

*APA trademarked structural wood panels. For the very best in versatility, durability and quality...in hundreds of construction, industrial and do-it-yourself applications.*

## KEY DEFINITIONS

### APA TRADEMARK

The APA – *The Engineered Wood Association's* trademarks appear only on products manufactured by APA member mills. The marks signify that the manufacturer is committed to APA's rigorous program of quality inspection and testing and that panel quality is subject to verification through APA audit – a procedure designed to assure manufacture in conformance with APA performance standards and/or *U.S. Product Standard PS 1-83 for Construction and Industrial Plywood*.

Unsanded and touch-sanded panels, and panels with “B” or better veneer on one side only, usually carry the APA trademark on the panel back. Panels with both sides of “B” or better veneer, or with special overlaid surfaces (such as Medium Density Overlay), carry the APA trademark on the panel edge.

### U.S. PRODUCT STANDARD PS 1-83

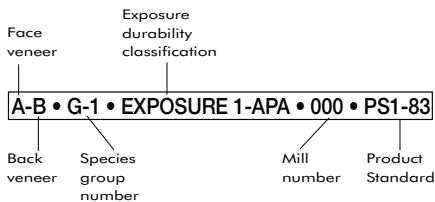
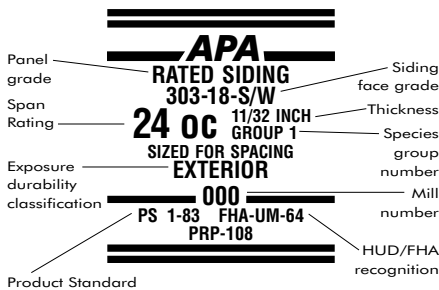
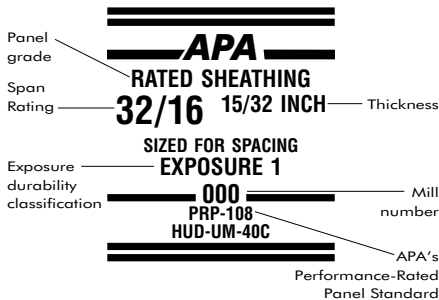
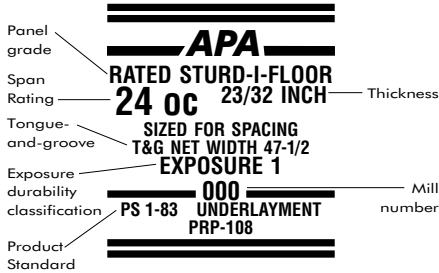
*U.S. Product Standard PS 1-83 for Construction and Industrial Plywood* is a voluntary commodity standard developed cooperatively by the U.S. Department of Commerce and the construction and industrial plywood industry. PS 1-83 establishes requirements for producing, marketing and specifying construction and industrial plywood. With the exception of Plyron and some APA Performance Rated Panels, all of the other plywood grades described in this guide are produced under the provisions of U.S. Product Standard PS 1-83.

Panels conforming to the product standard carry the notation “PS 1-83” in the lower portion of the APA trademark.

For a complete copy of *U.S. Product Standard PS 1-83 for Construction and Industrial Plywood*, Form H850, write the APA – *The Engineered Wood Association*.



## TYPICAL APA TRADEMARKS



## APA PERFORMANCE STANDARDS

APA performance standards are the result of manufacturing technology that makes possible the manufacture of structural panel products from wood by-products and species not provided for in U.S. *Product Standard PS 1-83*. APA performance standards deal exclusively with how a product must perform in a designated application rather than from what or how the product must be manufactured.

Panels produced under APA performance standards – called APA Performance Rated Panels – must meet several performance baseline requirements according to the panel's designated end use. These performance requirements include uniform and concentrated static and impact load capacity, fastener-holding ability, racking resistance, dimensional stability, and bond durability.

In addition to conventional veneer plywood, APA performance standards encompass such other panel products as composites and oriented strand board. (See APA Performance Rated Panels, page 8.)

For complete performance testing and qualification information, write APA for *PRP-108, Performance Standards and Policies for Structural-Use Panels*, Form E445.

## GRADE

The term “grade” may refer to *panel* grade or to *veneer* grade. Panel grades are generally identified in terms of the veneer grade used on the face and back of the panel (e.g., A-B, B-C, etc.), or by a name suggesting the panel's intended end use (e.g., APA Rated Sheathing, Underlayment, etc.).

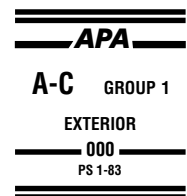
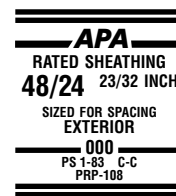
Veneer grades define veneer appearance in terms of natural unrepaired growth characteristics and allowable number and size of repairs that may be made during manufacture. The highest quality veneer is “A,”<sup>(1)</sup> the lowest “D.” The minimum grade

of veneer permitted in Exterior plywood is “C.” “D” veneer is used only in panels intended for interior use or for applications protected from permanent exposure to the weather.

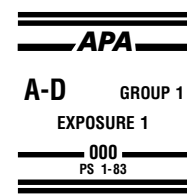
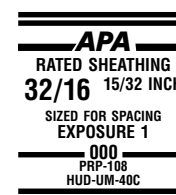
## EXPOSURE DURABILITY

APA trademarked panels may be produced in four exposure durability classifications – Exterior, Exposure 1, Exposure 2, and Interior. The exposure durability classification relates to glue bond, and thus to structural integrity. Since aesthetic (non-structural) attributes of panels may be compromised to some degree by exposure to weather<sup>(2)</sup>, installation recommendations in this publication are designed to provide optimum overall performance.


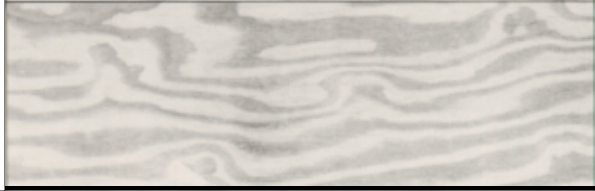
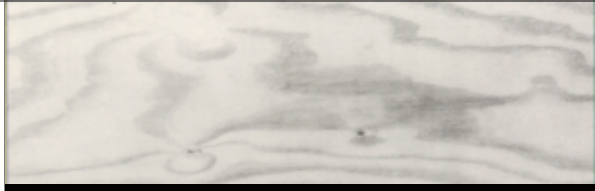
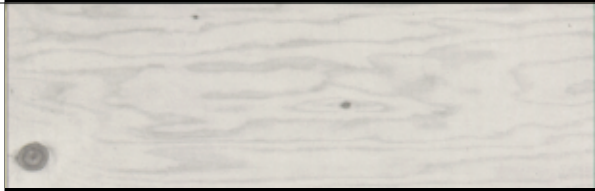

**Exterior** panels have a fully waterproof bond and are designed for applications subject to permanent exposure to the weather or to moisture.



**Exposure 1** panels have a fully water-proof bond and are designed for applications where long construction delays may be expected prior to providing protection, or where high moisture conditions may be encountered in service. Exposure 1 panels are made with the same exterior adhesives used in Exterior panels. However, because other compositional factors may affect bond performance, only Exterior panels should be used for permanent exposure to the weather.<sup>(3)</sup>



## VENEER GRADES

<p><b>A</b> Smooth, paintable. Not more than 18 neatly made repairs, boat, sled, or router type, and parallel to grain, permitted. Wood or synthetic repairs permitted. May be used for natural finish in less demanding applications.</p>	
<p><b>B</b> Solid surface. Shims, sled or router repairs, and tight knots to 1 inch across grain permitted. Wood or synthetic repairs permitted. Some minor splits permitted.</p>	
<p><b>C</b> Improved C veneer with splits limited to 1/8 inch width and knotholes or other open defects limited to 1/4 x 1/2 inch. Admits some broken grain. Wood or synthetic repairs permitted.</p> <p><b>Plugged</b></p>	
<p><b>C</b> Tight knots to 1-1/2 inch. Knotholes to 1 inch across grain and some to 1-1/2 inch if total width of knots and knotholes is within specified limits. Synthetic or wood repairs. Discoloration and sanding defects that do not impair strength permitted. Limited splits allowed. Stitching permitted.</p>	
<p><b>D</b> Knots and knotholes to 2-1/2 inch width across grain and 1/2 inch larger within specified limits. Limited splits allowed. Stitching permitted. Limited to Interior, Exposure 1 and Exposure 2 panels.</p>	

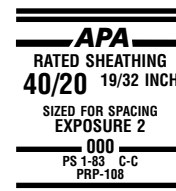
*NOTE: All-veneer APA Rated Sheathing Exposure 1, commonly called "CDX" in the trade, is frequently mistaken as an Exterior panel and erroneously used in applications for which it does not possess the required resistance to weather. "CDX" should only be used for applications as outlined under Exposure 1 above. For sheathing grade panels that will be exposed permanently to the weather, specify APA Rated Sheathing Exterior (C-C Exterior under PS 1.)*

*See Treated Plywood (page 18) for recommended plywood grades and exposure*

*durability classifications in applications requiring fire-retardant-treated or preservative-treated plywood.*

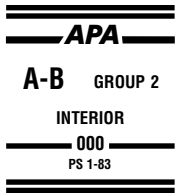
- (1) Some manufacturers also produce a premium "N" grade (natural finish) veneer, available only on special order.
- (2) Although glue bond durability is described by exposure durability classification, panel surface may become uneven and irregular under prolonged moisture exposure. Panels should be allowed to dry, and panel joints and surfaces may need to be sanded before applying some finish materials.
- (3) Exposure 1 panels may also be used when exposure to the outdoors is on the underside only, such as at roof overhangs.

**Exposure 2** panels (identified as Interior type with intermediate glue under PS 1) are intended for protected construction applications where only moderate delays in providing protection from moisture may be expected.



**Interior panels** which lack further glue-line information in their trademarks are manufactured with interior glue and are intended for interior applications only.

A-B • G-1 • INT-APA • 000 • PS1-83



### SPECIES GROUP NUMBER

Plywood manufactured under U.S. Product Standard PS 1-83 may be made from over 70 species of wood. These species are divided according to strength and stiffness properties into five groups. Group 1 species are the strongest and stiffest, Group 2 the next strongest and stiffest, and so on. The Group number appearing in an APA trademark is based on the species used for face and back veneers.<sup>(1)</sup> Some species are used widely in plywood manufacture; others rarely. Check local availability if a particular species is desired.

### SPAN RATINGS

Some APA trademarked panels – APA Rated Sheathing, APA Rated Sturd-I-Floor and APA Rated Siding – carry numbers in their trademarks called Span Ratings. These denote the maximum recommended center-to-center spacing in inches of supports over which the panel should be placed in construction applications.

### APA Rated Sheathing

Span Ratings appear as two numbers separated by a slash, such as 32/16, 48/24, etc.<sup>(2)</sup> The left-hand number denotes the maximum recommended spacing of supports when the panel is used for roof sheathing with the long dimension or strength axis of the panel across three or more supports. The right-hand number indicates the maximum recommended spacing of supports when the panel is used for subflooring with the long dimension or strength axis of the panel across three or more supports. A panel marked 32/16, for example, may be used for roof sheathing over supports 32 inches on center or for subflooring over supports 16 inches on center.

### APA Rated Sturd-I-

**Floor** panels are designed specifically for single-floor (combined subfloor-underlayment) applications under carpet and pad, and are manufactured with Span Ratings of 16, 20, 24, 32 and 48 inches. These, like those for APA Rated Sheathing, are based on application of the panel with the long dimension or strength axis across three or more supports.

**APA Rated Siding** is produced with Span Ratings of 16 and 24 inches. Panels and lap siding may be used direct to studs or over nonstructural wall sheathing (Sturd-I-Wall construction), or over nailable panel or lumber sheathing (double-wall construction). Panels and lap siding with a Span Rating of 16 inches may be applied direct to studs spaced 16 inches on center. Panels and lap siding bearing a Span Rating of 24 inches may be used direct to studs 24 inches on center. When used over nailable structural sheathing, the Span Rating of Rated Siding panels refers to the maximum recommended spacing of vertical rows of nails rather than to stud spacing.

### METRIC CONVERSIONS

Metric equivalents of nominal thicknesses and common sizes of wood structural panels are tabulated below. (1 inch = 25.4 millimeters):

Panel Nominal Thickness	
in.	mm
1/4	6.4
5/16	7.9
11/32	8.7
3/8	9.5
7/16	11.1
15/32	11.9
1/2	12.7
19/32	15.1
5/8	15.9
23/32	18.3
3/4	19.1
7/8	22.2
1	25.4
1-3/32	27.8
1-1/8	28.6

Panel Nominal Dimensions (Width x Length)		
ft.	mm	m (approx.)
4 x 8	1219 x 2438	1.22 x 2.44
4 x 9	1219 x 2743	1.22 x 2.74
4 x 10	1219 x 3048	1.22 x 3.05

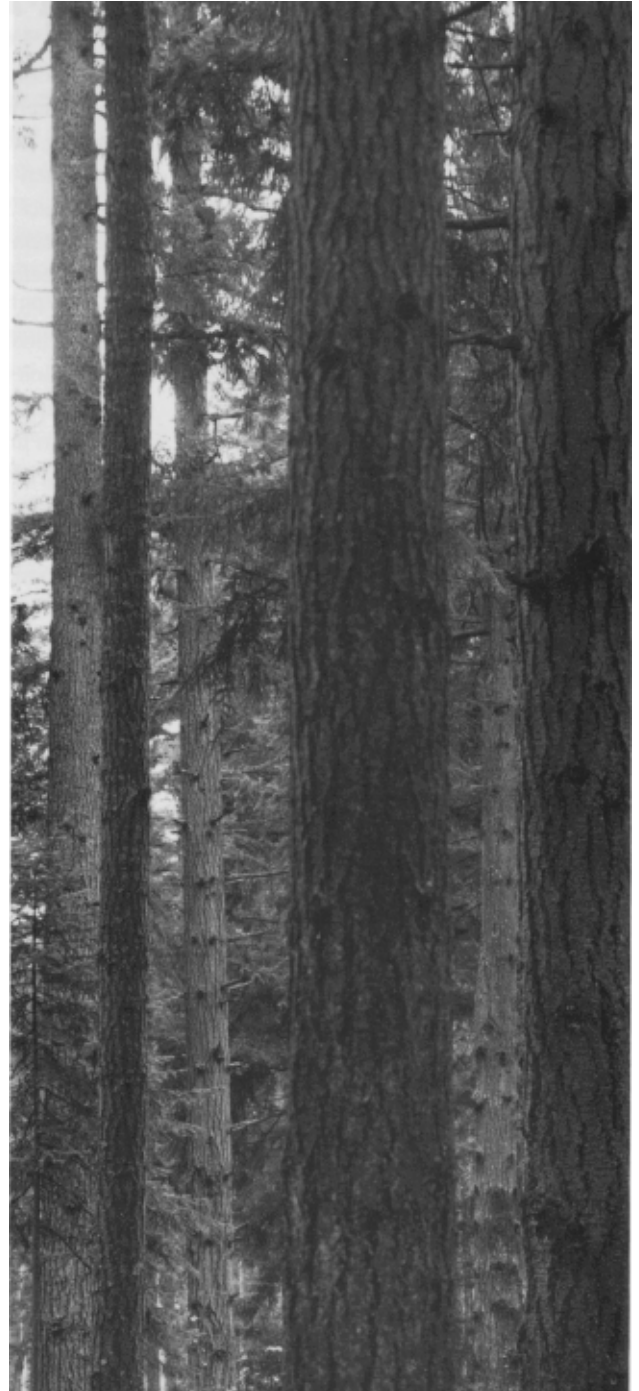
(1) Where face and back veneers are not from the same species group, the higher Group number is used, except for sanded panels 3/8 inch thick or less and Decorative (including APA Rated Siding 303) panels of any thickness. These are identified by face species because they are chosen primarily for appearance and used in applications where structural integrity is not critical. Sanded panels greater than 3/8 inch are identified by face species if C or D grade backs are at least 1/8 inch thick and are not more than one species group number larger.

(2) An exception is APA Rated Sheathing intended for use as wall sheathing only. The trademarks for these panels contain a single number similar to the Span Rating for APA Rated Sidings.

## CLASSIFICATION OF SPECIES

Group 1	Group 2	Group 3	Group 4	Group 5
Apitong	Cedar, Port	Alder, Red	Aspen	Basswood
Beech,	Orford	Birch, Paper	Bigtooth	Poplar,
American	Cypress	Cedar, Alaska	Quaking	Balsam
Birch	Douglas-	Fir,	Cativo	
Sweet	Fir 2 <sup>(a)</sup>	Subalpine	Cedar	
Yellow	Fir	Hemlock,	Incense	
Douglas-	Balsam	Eastern	Western	
Fir 1 <sup>(a)</sup>	California	Maple	Red	
Kapur	Red	Bigleaf	Cottonwood	
Keruing	Grand	Pine	Eastern	
Larch,	Noble	Jack	Black	
Western	Pacific	Lodgepole	(Western	
Maple, Sugar	Silver	Ponderosa	Poplar)	
Pine	White	Spruce	Pine	
Caribbean	Hemlock,	Redwood	Eastern	
Ocote	Western	Spruce	White	
Pine, South.	Lauan	Engelmann	Sugar	
Loblolly	Almon	White		
Longleaf	Bagtikan			
Shortleaf	Mayapis			
Slash	Red			
Tanoak	Tangile			
	White			
	Maple, Black			
	Mengkulang			
	Meranti,			
	Red <sup>(b)</sup>			
	Mersawa			
	Pine			
	Pond			
	Red			
	Virginia			
	Western			
	White			
	Spruce			
	Black			
	Red			
	Sitka			
	Sweetgum			
	Tamarack			
	Yellow-			
	Poplar			

- (a) Douglas-Fir from trees grown in the states of Washington, Oregon, California, Idaho, Montana, Wyoming, and the Canadian Provinces of Alberta and British Columbia shall be classed as Douglas-Fir No. 1. Douglas-Fir from trees grown in the states of Nevada, Utah, Colorado, Arizona and New Mexico shall be classed as Douglas-Fir No. 2.
- (b) Red Meranti shall be limited to species having a specific gravity of 0.41 or more based on green volume and oven dry weight.



## APA PERFORMANCE RATED PANELS

APA Performance Rated Panels include three grades – APA Rated Sheathing for residential and other light-frame sub-flooring, wall sheathing and roof sheathing applications; APA Rated Sturd-I-Floor for residential and other light-frame single-floor (combined subfloor-underlayment) applications under carpet and pad; and APA Rated Siding for residential and other siding applications direct to studs or over nailable structural sheathing. Each grade may be manufactured in a variety of ways – as conventional plywood, as composite panels (veneer faces bonded to reconstituted wood cores), or as oriented strand board (OSB).

All APA Performance Rated Panels, regardless of composition, are designed to meet or exceed performance requirements for their designated applications over the spans indicated in the APA trademark. APA Performance Standards are recognized by model building codes through the National Evaluation Service and by HUD.<sup>(1)</sup>

In addition to meeting APA performance criteria, all-veneer APA Rated Sheathing, Sturd-I-Floor and Siding panels often meet all of the provisions of *U.S. Product Standard PS 1-83 for Construction and Industrial Plywood*.

Panels meeting PS1 provisions carry the notation “PS 1-83” in the APA trademark.

For particularly demanding engineered applications where cross-panel strength and stiffness or shear properties are of maximum importance, Structural I Rated Sheathing is recommended.

APA trademarked oriented strand board, in addition to its primary use in construction, also is widely used in do-it-yourself applications. The distinctive appearance and good-two-side feature of OSB panels are among the many reasons for this growing market.

For additional information, write for APA’s ***Performance Rated Panels, Form F405.***

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(1) The National Evaluation Service is sponsored jointly by the Building Officials and Code Administrators International, promulgators of the National Building Code; the International Conference of Building Officials, promulgators of the Uniform Building Code; and the Southern Building Code Congress International, promulgators of the Standard Building Code. See National Evaluation Service Report No. NER-108

for allowable values and/or conditions of use concerning material presented in this brochure. It is subject to reexamination, revisions, and possible cancellation.

HUD recognition of wood-based Performance Rated Panels is contained in Use of Materials Bulletin UM-40c, or in UM-64 for APA Rated Siding-303 (plywood).



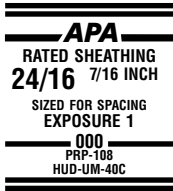


# GUIDE TO APA PERFORMANCE RATED PANELS

Trademarks Shown Are Typical Facsimiles

## APA RATED SHEATHING

Specially designed for subflooring, wall sheathing and roof sheathing, but also used for broad range of other construction, industrial and do-it-yourself applications. Can be manufactured as conventional plywood, as a composite, or as oriented strand board. SPAN RATINGS: 12/0, 16/0, 20/0, 24/0, 24/16, 32/16, 40/20, 48/24, WALL-16 oc, WALL-24 oc. EXPOSURE DURABILITY CLASSIFICATIONS: Exterior, Exposure 1, Exposure 2. COMMON THICKNESSES: 5/16, 3/8, 7/16, 15/32, 1/2, 19/32, 5/8, 23/32, 3/4.



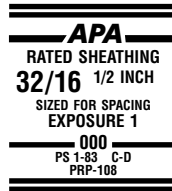
## APA RATED STURD-I-FLOOR

Specially designed as combination subfloor-underlayment. Provides smooth surface for application of carpet and pad, and possesses high concentrated and impact load resistance. Can be manufactured as conventional plywood, as a composite, or as oriented strand board. Available square edge or tongue-and-groove. SPAN RATINGS: 16, 20, 24, 32, 48. EXPOSURE DURABILITY CLASSIFICATIONS: Exterior, Exposure 1, Exposure 2. COMMON THICKNESSES: 19/32, 5/8, 23/32, 3/4, 1, 1-1/8.



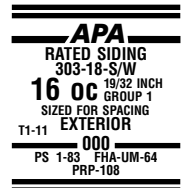
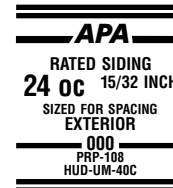
## APA STRUCTURAL I RATED SHEATHING

Unsanded grade for use where cross-panel strength and stiffness or shear properties are of maximum importance, such as panelized roofs, diaphragms and shear walls. Can be manufactured as conventional plywood, a composite, or oriented strand board. All plies in Structural I plywood panels are special improved grades and panels marked PS 1 are limited to Group 1 species. (Structural II plywood panels are also provided for, but rarely manufactured. Application recommendations for Structural II plywood are identical to those for APA RATED SHEATHING plywood.) SPAN RATINGS: 20/0, 24/0, 24/16, 32/16, 40/20, 48/24. EXPOSURE DURABILITY CLASSIFICATIONS: Exterior, Exposure 1. COMMON THICKNESSES: 5/16, 3/8, 7/16, 15/32, 1/2, 19/32, 5/8, 23/32, 3/4.



## APA RATED SIDING

For exterior siding, fencing, etc. Can be manufactured as conventional veneered plywood, as a composite or as an overlaid oriented strand board siding. Both panel and lap siding available. Special surface treatment such as V-groove, shallow channel groove, deep groove (such as APA Texture 1-11), kerfed groove, brushed, rough sawn and texture-embossed (MDO). Span Rating (stud spacing for siding qualified for APA Sturd-I-Wall applications) and face grade classification (for veneer-faced siding) indicated in trademark. EXPOSURE DURABILITY CLASSIFICATION: Exterior. COMMON THICKNESSES: 11/32, 3/8, 15/32, 1/2, 19/32, 5/8.



NOTE: Specify Performance Rated Panels by thickness and Span Rating. Span Ratings are based on panel strength and stiffness. Since these properties are a function of panel composition and configuration as well as thickness, the same Span Rating may appear on panels of different thicknesses. Similarly, panels of the same thickness may be marked with different Span Ratings.

## APA RATED SIDINGS



APA Rated Sidings include a wide variety of surface textures and patterns, most of them developed for optimum performance with stain finishes. Typical surface patterns are illustrated and described on pages 10-12. Actual dimensions of groove spacing, width and depth may vary with the manufacturer. Where the characteristics of a particular wood species are desired, specify by grade and species preference.

In order to help specifiers select the most appropriate siding appearance for a specific project, APA Rated Siding-303 (plywood) is also identified by a grading system. There are four basic siding classifications within the system – Special Series 303, 303-6, 303-18 and 303-30. Each class, as shown in the table on page 12, is further divided into grades according to categories of repair and

appearance characteristics. Depending on species, type of repair, finishing, etc., premium appearance products may be found in all grades. Some grades may be difficult to obtain in some areas. Check with your supplier before specifying.

In addition to their primary use as an exterior siding on all kinds of residential, commercial, institutional and industrial structures, APA Rated Sidings are also used for scores of other indoor and outdoor applications.

For complete application recommendations, write for APA's *Design/Construction Guide: Residential & Commercial*, Form E30; for finishing recommendations, *APA Product Guide: Performance Rated Sidings*, Form E300; and for manufacturing and grading information, *303 Siding Manufacturing Specifications*, Form B840.

### APA TEXTURE 1-11

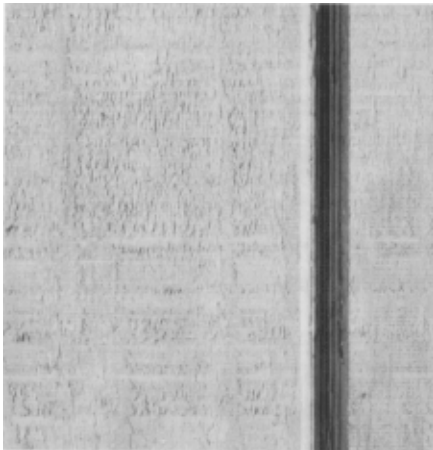
APA Rated Siding-303 plywood panel with shiplapped edges and parallel grooves 1/4 inch deep, 3/8 inch wide; grooves 4 inches or 8 inches o.c. are standard. Other spacings may be available on special order. T1-11 is available only in 19/32 inch and 5/8 inch thicknesses. Rough-sanded panel shown. Also available with scratch-sanded, overlaid, brushed and other surfaces. Available in Douglas-fir, southern pine, cedar, redwood, and other species.

### ROUGH SAWN

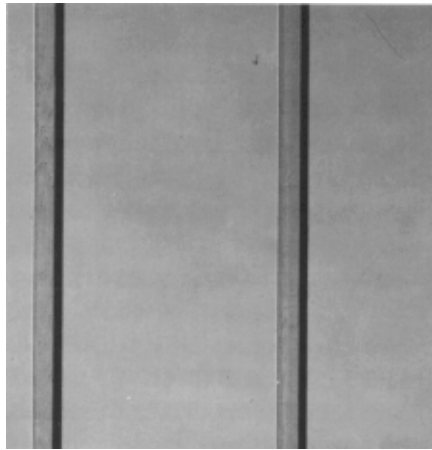
Manufactured with a slight, rough-sawn texture running across panel. Available without grooves, or with grooves of various styles; in lap sidings, as well as in panel form. Generally available in 11/32 inch, 3/8 inch, 15/32 inch, 1/2 inch, 19/32 inch and 5/8 inch thicknesses. Rough sawn also available in kerfed (shown) with grooves typically 4 inches o.c. in multiples of 2 inches, Texture 1-11, reverse board-and-batten, channel groove and V-groove (15/32 inch, 1/2 inch, 19/32 inch, or 5/8 inch thick). Available in Douglas-fir, southern pine, redwood, cedar, and other species.

### COM-PLY®

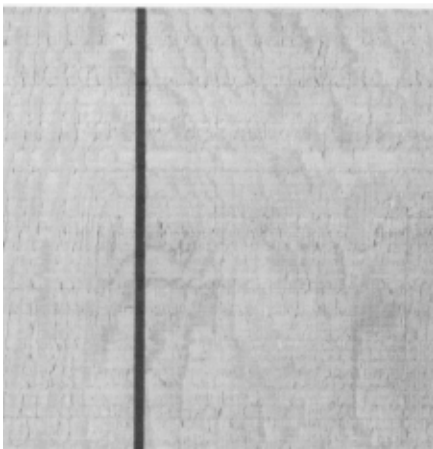
APA Rated Siding composite panel with rough-sawn veneer faces bonded to solid, reconstituted structural wood core. Available with grooves typically 4 inches or 8 inches o.c., similar to Texture 1-11; or 1-1/2 inch-wide grooves spaced 12 inches o.c., similar to reverse board-and-batten pattern. Available in 19/32 inch, and 5/8 inch thicknesses. Long edges shiplapped for continuous pattern. Available with Douglas-fir or cedar veneer faces.



**APA Texture 1-11**



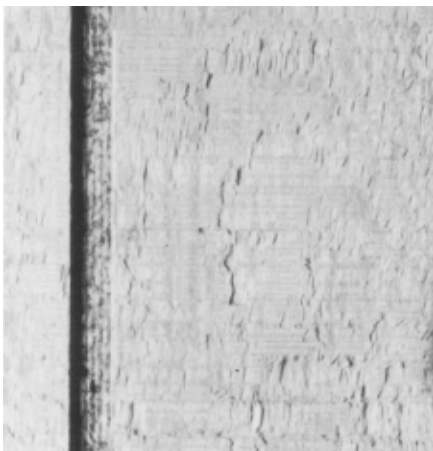
**Medium Density Overlay**



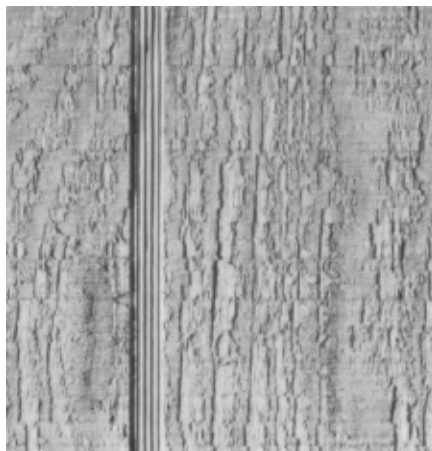
**Rough Sawn**



**Brushed**



**Com-Ply®**



**Channel Groove**

**MEDIUM DENSITY  
OVERLAY**

Available without grooving; with V-grooves (spaced 6 inches or 8 inches o.c. usually standard); or in T1-11 or reverse board-and-batten grooving as illustrated. MDO panel siding available in 11/32 inch, 3/8 inch, 15/32 inch, 1/2 inch, 19/32 inch, or 5/8 inch thicknesses; also in lap siding. MDO siding is overlaid on one side and available with texture-embossed or smooth surface.

**BRUSHED**

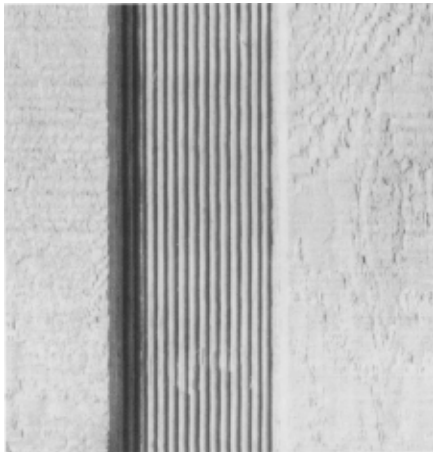
Brushed or relief-grain textures accent the natural grain pattern to create striking surfaces. Generally available in 11/32 inch, 3/8 inch, 15/32 inch, 1/2 inch, 19/32 inch, and 5/8 inch thicknesses. Available in Douglas-fir, cedar and other species.

**CHANNEL GROOVE**

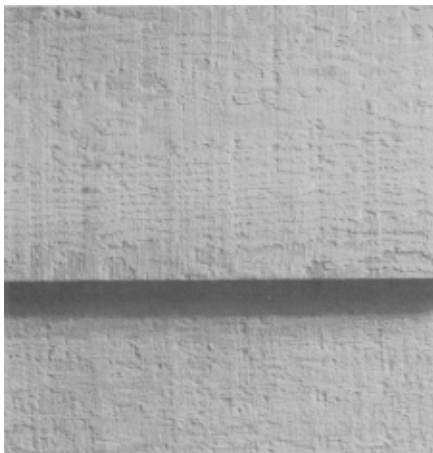
Shallow grooves about 1/16 inch deep, 3/8 inch wide, cut into faces of panels, 4 inches or 8 inches o.c. Other groove spacings available. Shiplapped for continuous patterns. Generally available in surface patterns and textures similar to Texture 1-11 and in 11/32 inch, 3/8 inch, 15/32 inch, or 1/2 inch thicknesses. Available in Douglas-fir, southern pine, cedar, redwood and other species.

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NOTE: Specific groove patterns, surface textures, species and panel thicknesses may be in limited supply in some areas. Check with your supplier before specifying.



**Reverse Board-and-Batten**



**Lap Siding**

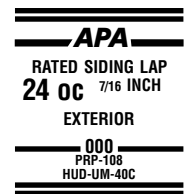
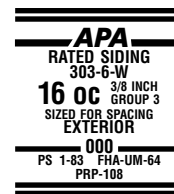
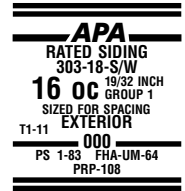
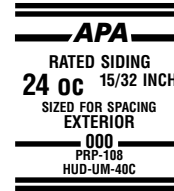
**REVERSE BOARD-AND-BATTEN**

Deep, wide grooves cut into brushed, rough sawn, scratch-sanded or other textured surfaces. Grooves about 1/4 inch deep, 1 inch to 1-1/2 inches wide, spaced 8 inches or 12 inches o.c. with panel thickness of 19/32 inch and 5/8 inch. Provides deep, sharp shadow lines. Long edges shiplapped for continuous pattern. Available in Douglas-fir, southern pine, cedar, redwood and other species.

**LAP SIDING**

Rough-sawn or smooth overlaid surfaces, with square or beveled edges. In some cases, lap siding is made of APA Rated Siding-303 panels, cut to lap siding dimensions. Available in 11/32 inch, 3/8 inch, 15/32 inch, 1/2 inch, 19/32 inch and 5/8 inch thicknesses.

**GUIDE TO APA RATED SIDING Trademarks Shown Are Typical Facsimiles**



**APA RATED SIDING - 303 FACE GRADES**

CLASS	GRADES <sup>(1)</sup>	PATCHES	
		WOOD	SYNTHETIC
Special Series 303 <sup>(2)</sup>	303-OC <sup>(3)</sup> 303-OL <sup>(4)</sup> 303-NR <sup>(5)</sup> 303-SR <sup>(6)</sup>	Not permitted Not applicable for overlays Not permitted Not permitted	Not permitted Not permitted Permitted as natural-defect shape only
303-6 <sup>(2)</sup>	303-6-W 303-6-S 303-6-S/W	Limit 6 Not permitted Limit 6 – any combination	Not permitted Limit 6
303-18	303-18-W 303-18-S 303-18-S/W	Limit 18 Not permitted Limit 18 – any combination	Not permitted Limit 18
303-30 <sup>(2)</sup>	303-30-W 303-30-S 303-30-S/W	Limit 30 Not permitted Limit 30 – any combination	Not permitted Limit 30

(1) Limitations on grade characteristics are based on 4 ft. x 8 ft. panel size. Limits on other sizes vary in proportion. All panels except 303-NR allow restricted minor repairs such as shims. These and such other face appearance characteristics as knots, knotholes, splits, etc., are limited by both size and number in accordance with panel grades, 303-OC being most restrictive and 303-30 being least. Multiple repairs are permitted only on 303-18 and 303-30 panels. Patch size is restricted on all panel grades.

(2) Check local availability.  
 (3) "Clear"  
 (4) "Overlaid" (e.g., Medium Density Overlay siding)  
 (5) "Natural Rustic"  
 (6) "Synthetic Rustic"

## APA SANDED & TOUCH-SANDED PLYWOOD

Panels with B-grade or better veneer faces are sanded smooth in manufacture to fulfill the requirements of their intended end use – applications such as cabinets, shelving, furniture, built-ins, etc. These sanded panel grades – identified by face and back veneer – are widely used in a multitude of construction, industrial and do-it-yourself applications where strength and stiffness combined with premium appearance or surface smoothness is required.

When sanded plywood is manufactured with a special plugged inner-ply construction to resist dents and punctures from concentrated loads, it also may be used for nonstructural floor underlayment as a substrate for vinyl or other resilient flooring. The smooth, sanded surface and excellent dimensional stability makes these panels ideal for floor underlayment applications.

Touch-sanded panels – Underlayment, C-C Plugged, and C-D Plugged – are sanded only for “sizing” to assure uniform panel thickness.

Typical sanded and touch-sanded panel applications are described at right. For complete application recommendations for sanded plywood in industrial applications, write APA. Industrial use guides are available on *Materials Handling*, Form M200; *Slave Pallets*, Form S225; and *Transport Equipment*, Form G210.

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NOTE: Exterior sanded panels, C-C Plugged, C-D Plugged and Underlayment grades can also be manufactured in Structural I (all plies limited to Group 1 species).

### GUIDE TO APA-SANDED & TOUCH-SANDED PLYWOOD Trademarks Shown Are Typical Facsimiles

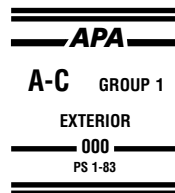
#### APA A-A

Use where appearance of both sides is important for interior applications such as built-ins, cabinets, furniture, partitions; and exterior applications such as fences, signs, boats, shipping containers, tanks, ducts, etc. Smooth surfaces suitable for painting. EXPOSURE DURABILITY CLASSIFICATIONS: Interior, Exposure 1, Exterior. COMMON THICKNESSES: 1/4, 11/32, 3/8, 15/32, 1/2, 19/32, 5/8, 23/32, 3/4.

A-A • G-1 • EXPOSURE 1-APA • 000 • PS1-83

#### APA A-C

For use where appearance of one side is important in exterior applications such as soffits, fences, structural uses, boxcar and truck linings, farm buildings, tanks, trays, commercial refrigerators, etc.<sup>(1)</sup> EXPOSURE DURABILITY CLASSIFICATION: Exterior. COMMON THICKNESSES: 1/4, 11/32, 3/8, 15/32, 1/2, 19/32, 5/8, 23/32, 3/4.



#### APA B-B

Utility panels with two solid sides. EXPOSURE DURABILITY CLASSIFICATIONS: Interior, Exposure 1, Exterior. COMMON THICKNESSES: 1/4, 11/32, 3/8, 15/32, 1/2, 19/32, 5/8, 23/32, 3/4.

B-B • G-2 • EXPOSURE 1-APA • 000 • PS1-83

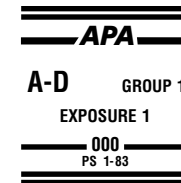
#### APA A-B

For use where appearance of one side is less important but where two solid surfaces are necessary. EXPOSURE DURABILITY CLASSIFICATIONS: Interior, Exposure 1, Exterior. COMMON THICKNESSES: 1/4, 11/32, 3/8, 15/32, 1/2, 19/32, 5/8, 23/32, 3/4.

A-B • G-1 • EXPOSURE 1-APA • 000 • PS1-83

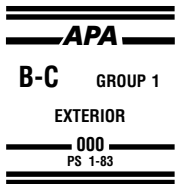
#### APA A-D

For use where appearance of only one side is important in interior applications, such as paneling, built-ins, shelving, partitions, flow racks, etc.<sup>(1)</sup> EXPOSURE DURABILITY CLASSIFICATIONS: Interior, Exposure 1. COMMON THICKNESSES: 1/4, 11/32, 3/8, 15/32, 1/2, 19/32, 5/8, 23/32, 3/4.



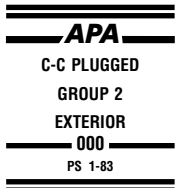
### APA B-C

Utility panel for farm service and work buildings, boxcar and truck linings, containers, tanks, agricultural equipment, as a base for exterior coatings and other exterior uses.<sup>(1)</sup> EXPOSURE DURABILITY CLASSIFICATION: Exterior. COMMON THICKNESSES: 1/4, 11/32, 3/8, 15/32, 1/2, 19/32, 5/8, 23/32, 3/4.



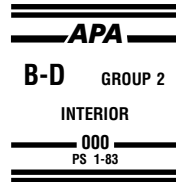
### APA C-C PLUGGED<sup>(3)</sup>

For use as an underlayment over structural subfloor, refrigerated or controlled atmosphere storage rooms, pallet fruit bins, tanks, boxcar and truck floors and linings, and other exterior applications. Provides smooth surface for application of carpet and pad, and possesses high concentrated and impact load resistance. Touch-sanded. For areas to be covered with resilient flooring, specify panels with “sanded face.” EXPOSURE DURABILITY CLASSIFICATION: Exterior. COMMON THICKNESSES<sup>(4)</sup>: 11/32, 3/8, 1/2, 19/32, 5/8, 23/32, 3/4.



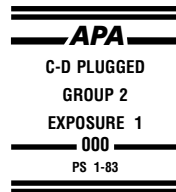
### APA B-D

Utility panel for backing, sides of built-ins, industry shelving, slip sheets, separator boards, bins and other interior or protected applications.<sup>(1)</sup> EXPOSURE DURABILITY CLASSIFICATIONS: Interior, Exposure 1. COMMON THICKNESSES: 1/4, 11/32, 3/8, 15/32, 1/2, 19/32, 5/8, 23/32, 3/4.



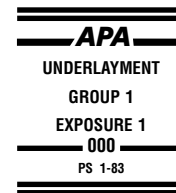
### APA C-D PLUGGED

For open soffits, built-ins, cable reels, walkways, separator boards and other interior or protected applications. Not a substitute for Underlayment or APA Rated Sturd-I-Floor as it lacks their puncture resistance. Touch-sanded. EXPOSURE DURABILITY CLASSIFICATIONS: Interior, Exposure 1. COMMON THICKNESSES: 3/8, 1/2, 19/32, 5/8, 23/32, 3/4.



### APA UNDERLAYMENT

For application over structural subfloor. Provides smooth surface for application of carpet and pad, and possesses high concentrated and impact load resistance. Touch sanded. For areas to be covered with resilient flooring, specify panels with “sanded face.”<sup>(2)</sup> EXPOSURE DURABILITY CLASSIFICATIONS: Interior, Exposure 1. COMMON THICKNESSES<sup>(4)</sup>: 1/4, 11/32, 3/8, 1/2, 19/32, 5/8, 23/32, 3/4.



(1) For nonstructural floor underlayment, or other applications requiring improved inner-ply construction, specify panels marked either “plugged inner plies” (also may be designated plugged crossbands under face or plugged crossbands or core); or “meets underlayment requirements.”

(2) Also available in Underlayment A-C or Underlayment B-C grades, marked either “touch sanded” or “sanded face.”

(3) Also may be designated APA Underlayment C-C Plugged.

(4) Underlayment and C-C Plugged panels 1/2” and thicker are designated by Span Rating rather than species group number in trademark.

## APA SPECIALTY PANELS

APA trademarked specialty grades include panels designed for specific applications (e.g., B-B Plyform for concrete forming, Marine), or with special surface treatments for applications with specific performance requirements (e.g., Medium and High Density Overlay, Plyron).

Complete concrete forming design data are contained in APA's *Concrete Forming*, Form V345. For additional information on High and Medium Density Overlay plywood, write for *HDO/MDO Plywood*, Form B360.

### GUIDE TO APA SPECIALTY PANELS Trademarks Shown Are Typical Facsimiles

#### APA HIGH DENSITY OVERLAY (HDO)

Plywood panel manufactured with a hard, semi-opaque resin-fiber overlay on both sides. Extremely abrasion resistant and ideally suited to scores of punishing construction and industrial applications, such as concrete forms, industrial tanks, work surfaces, signs, agricultural bins, exhaust ducts, etc. Also available with skid-resistant screen-grid surface and in Structural I. EXPOSURE DURABILITY CLASSIFICATION: Exterior. COMMON THICKNESSES: 3/8, 1/2, 5/8, 3/4.

HDO • A-A • G-1 • EXT-APA • 000 • PS1-83

#### APA MARINE

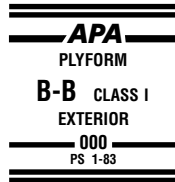
Specially designed plywood panel made only with Douglas-fir or western larch, solid jointed cores, and highly restrictive limitations on core gaps and face repairs. Ideal for boat hulls and other marine applications. Also available with HDO or

MDO faces. EXPOSURE DURABILITY CLASSIFICATION: Exterior. COMMON THICKNESSES: 1/4, 3/8, 1/2, 5/8, 3/4.

MARINE • A-A • EXT-APA • 000 • PS1-83

#### APA B-B PLYFORM CLASS I

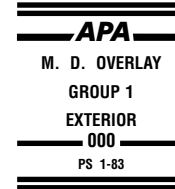
APA proprietary concrete form panels designed for high reuse. Sanded both sides and mill-oiled unless otherwise specified. Special restrictions on species. Also available in HDO for very smooth concrete finish, in Structural I, and with special overlays. EXPOSURE DURABILITY CLASSIFICATION: Exterior. COMMON THICKNESSES: 19/32, 5/8, 23/32, 3/4.



#### APA MEDIUM DENSITY OVERLAY (MDO)

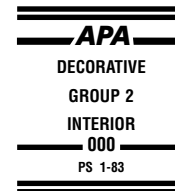
Plywood panel manufactured with smooth, opaque, resin-treated fiber overlay providing ideal base for paint on one or both sides. Excellent material choice for shelving, factory work surfaces, paneling, built-ins, signs and numerous other construction and industrial applications. Also available as APA Rated Siding-303 with texture-embossed or smooth surface on one side only and in Structural I. EXPOSURE DURABILITY

CLASSIFICATION: Exterior. COMMON THICKNESSES: 11/32, 3/8, 15/32, 1/2, 19/32, 5/8, 23/32, 3/4.



#### APA DECORATIVE

Rough sawn, brushed, grooved, or other faces. For paneling, interior accent walls, built-ins, counter facing, exhibit displays, etc. Made by some manufacturers in Exterior for exterior siding, gable ends, fences and other exterior applications. Use recommendations for Exterior panels vary; check with the manufacturer. EXPOSURE DURABILITY CLASSIFICATIONS: Interior, Exposure 1, Exterior. COMMON THICKNESSES: 5/16, 3/8, 1/2, 5/8.

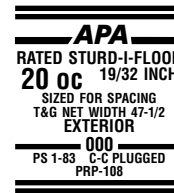
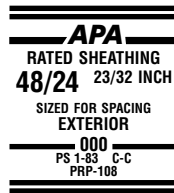
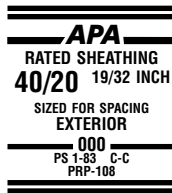
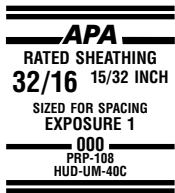


#### APA PLYRON

APA proprietary plywood panel with hard-board face on both sides. Faces tempered, untempered, smooth or screened. For countertops, shelving, cabinet doors, concentrated load flooring, etc. EXPOSURE DURABILITY CLASSIFICATIONS: Interior, Exposure 1, Exterior. COMMON THICKNESSES: 1/2, 5/8, 3/4.

PLYRON • EXPOSURE1-APA • 000

## GUIDE TO SPECIFICATIONS



### ROUGH CARPENTRY SECTION (CSI DIVISION 6)

#### A. GENERAL PROVISIONS

1. Identification Requirements – Each panel shall be identified with the appropriate trademark<sup>(1)</sup> of the APA – *The Engineered Wood Association*, and shall meet the requirements of the latest edition of U.S. Product Standard PS 1 or APA PRP-108 Performance Standards.
2. All panels which have any edge or surface permanently exposed to the weather shall be classed Exterior.<sup>(3)(16)</sup>
3. Panel thickness, grade, and Group number or Span Rating shall be at least equal to that shown on the drawings.<sup>(4)</sup> Application shall be in accordance with recommendations of the APA – *The Engineered Wood Association*.<sup>(5)</sup>

#### B. ROOF SHEATHING

1. Panel roof sheathing shall be (specify appropriate grade):  
 APA RATED SHEATHING EXP 1 or 2  
 APA RATED SHEATHING EXT  
 APA STRUCTURAL I  
 RATED SHEATHING EXP 1,  
 or APA STRUCTURAL I  
 RATED SHEATHING EXT.

Sheathing permanently exposed to weather shall be classed Exterior.<sup>(16)</sup>

Install with the long dimension or strength axis of the panel across supports, except where noted,<sup>(7)</sup> and with panel continuous over two or more spans. For pitched roofs, wear skid-resistant shoes when installing roof sheathing. Place screened surface or side with skid-resistant coating up, if oriented strand board panels are used. Suitable edge support shall be provided where indicated on drawings (or in recommendations of APA – *The Engineered Wood Association*)<sup>(4)</sup> by use of panel clips, tongue-and-groove edges, or lumber blocking between joists. Panel end joints shall occur over framing. **Spacing of 1/8 inch is recommended at panel ends and edges**, unless otherwise indicated by the panel manufacturer.

Nail 6 inches o.c. along supported panel edges and 12 inches o.c. at intermediate supports, except that when supports are spaced 48 inches o.c. or more, space nails 6 inches o.c. at all supports.<sup>(8)</sup> Use 6d common nails for panels 1/2 inch and less and 8d for greater thicknesses, except that when panels are 1-1/8 inches, use 8d ring-shank or 10d common.<sup>(10)</sup>

Cover roof sheathing as soon as possible with roofing felt or shingle underlayment

for protection against excessive moisture prior to roofing application.

#### C. FLOORS

1. Subflooring (under structural finish floor such as wood strip or underlayment) – Panel subflooring shall be (specify appropriate grade):

APA RATED SHEATHING EXP 1 or 2  
 APA RATED SHEATHING EXT  
 APA STRUCTURAL I  
 RATED SHEATHING EXP 1,  
 or APA STRUCTURAL I  
 RATED SHEATHING EXT.

Install with the long dimension or strength axis of the panel across supports and with panel continuous over two or more spans. Panel end joints shall occur over framing. **Spacing of 1/8 inch is recommended at panel ends and edges**, unless otherwise indicated by the panel manufacturer.

Nail 6 inches o.c. along supported panel edges and 12 inches o.c. at intermediate supports with 6d common nails<sup>(8)</sup> for panels 1/2 inch or less, 8d for greater thicknesses. Where panels are 1-1/8 inches thick and supports are 48 inches o.c., nails shall be 8d ring-shank or 10d common and spaced 6 inches o.c. at all supports.<sup>(10)</sup>

(1) The APA trademarks shown here are typical examples only.

(2) For 1/4-inch-thick panels, nail 3 inches o.c. along panel edges and 6 inches o.c. each way throughout remainder of panel with 3d ring-shank nails.

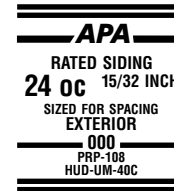
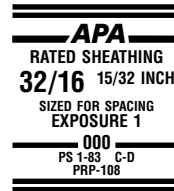
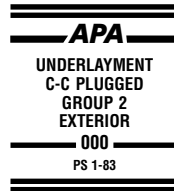
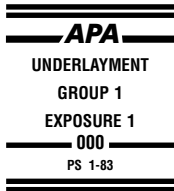
(3) Exposure 1 may be specified for applications where prolonged but temporary exposure to the weather will be required.

(4) Refer to the appropriate application recommendations in *APA Design/Construction Guide: Residential & Commercial, E30*.

(5) References to APA's recommendations may allow subsequent specification concerning nailing, edge support and panel orientation to be omitted.

(6) For areas to be covered with resilient flooring, specify Underlayment or C-C Plugged panel grades marked "Sanded Face." Underlayment A-C, Underlayment B-C, Marine EXT, or sanded plywood grades marked "Plugged Crossbands Under Face," "Plugged Crossbands (or Core)," "Plugged Inner Plies" or "Meets Underlayment Requirements" (of PS 1-83) may also be used under resilient flooring.





Sand subfloor joints if necessary to smooth surface prior to installing underlayment or finish flooring.

**2. Combined subfloor-underlayment (under carpet and pad)<sup>(17)</sup>** – Combined subfloor-underlayment panels shall be (specify appropriate grade):

APA RATED STURD-I-FLOOR

EXP 1 or 2, or

APA RATED STURD-I-FLOOR EXT.

**Install with the long dimension or strength axis of the panel across supports and with panel continuous over two or more spans.** Panel edges shall be tongue-and-groove or supported on 2-inch lumber blocking installed between joists. Protect against damage until finish floor is installed.

**Stagger panel end joints.** Panel end joints shall occur over framing. **Spacing of 1/8 inch is recommended at panel ends and edges**, unless otherwise indicated by the panel manufacturer. For nailed floors, nail panels 6 inches o.c. at supported panel edges and 12 inches o.c. at intermediate supports, except that when supports are spaced 48 inches o.c., space nails 6 inches o.c. at all supports.

Use 6d ring- or screw-shank nails for panels 3/4 inch thick or less, and 8d for thicker panels. With 1-1/8 inch panels, 10d common nails may be used if supports are well seasoned.<sup>(10)</sup>

Fill and thoroughly sand end and edge joints.<sup>(13)</sup> Lightly sand any surface roughness and around fasteners.

For field-glued floors, use adhesives meeting **APA Specification AFG-01**, applied in accordance with the manufacturer's recommendations. If oriented strand board panels with sealed surfaces and edges are used, use only solvent-based glues; check with panel manufacturer. Apply continuous line of glue on joists, and continuous or spaced line of glue in groove of tongue-and-groove panels. Use 6d ring- or screw-shank nails spaced 12 inches o.c. at supported panel edges and intermediate bearings.<sup>(11)</sup>

**3. Underlayment (over subflooring)** – Plywood underlayment shall be (specify appropriate grade)<sup>(6)</sup>:

APA UNDERLAYMENT INT

APA UNDERLAYMENT EXP 1,

or APA UNDERLAYMENT C-C

PLUGGED EXT, or

APA C-C PLUGGED EXT.

When 19/32 inch or thicker, APA RATED STURD-I-FLOOR EXP 1 or 2 or APA RATED STURD-I-FLOOR EXT may be specified. Apply underlayment just prior to laying finish floor and protect against damage until finish floor is installed.

For maximum stiffness, install underlayment panels with the face grain across supports. Stagger end joints (optional under carpet and pad) and offset all joints by at least two inches from joints of subfloor panels. **Butt panel ends and edges to a close but not tight fit (1/32 inch spacing is recommended).** Nail 6 inches o.c. along panel edges and 8 inches o.c. each way throughout remainder of panel with 3d ring-shank nails for panel thicknesses of 11/32 inch to 1/2 inch, or 4d spaced 6 inches o.c. along edges and 12 inches o.c. each way for thicker panels up to 3/4 inch.<sup>(2)(10)</sup> Fastener length should be approximately equal to the total thickness of the underlayment and subfloor.

Fill and thoroughly sand edge and end joints.<sup>(13)</sup> Lightly sand any surface roughness and around fasteners.

## D. WALLS AND SOFFITS

**1. Panel wall sheathing** shall be (specify appropriate grade):

APA RATED SHEATHING EXP 1 or 2

APA RATED SHEATHING EXT

APA STRUCTURAL I RATED

SHEATHING EXP 1, or

APA STRUCTURAL I RATED

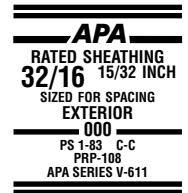
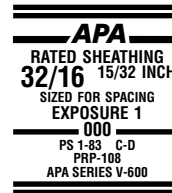
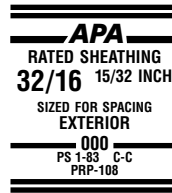
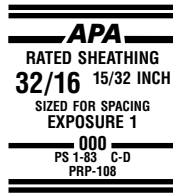
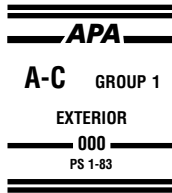
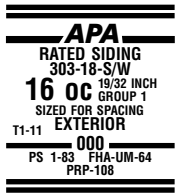
SHEATHING EXT.

(7) Long dimension of panel may be parallel to supports if panel has adequate thickness. See *APA Design/Construction Guide: Residential & Commercial*, E30 for recommendations.

(8) Engineered shear walls and diaphragms may require additional nailing. See *APA Design/Construction Guide: Residential & Commercial*, E30 for recommendations.

(9) Hot-dipped or hot-tumbled galvanized steel nails are recommended for most siding applications. For best performance, stainless steel nails or aluminum nails should be considered. APA tests also show that electrically or mechanically galvanized steel nails appear satisfactory when plating meets or exceeds thickness requirements of ASTM A641 Class 2 coatings, and is further protected by yellow

chromate coating. **Note:** Galvanized fasteners may react under wet conditions with the natural extractives of some wood species and may cause staining if left unfinished. Such staining can be minimized if the siding is finished in accordance with APA recommendations, or if the roof overhang protects the siding from direct exposure to moisture and weathering.



Spacing of 1/8 inch is recommended at panel ends and edges, unless otherwise indicated by the panel manufacturer.

Nail 6 inches o.c. along supported panel edges and 12 inch o.c. at intermediate supports with 6d common nails for panels 1/2 inch and less, and 8d for greater thicknesses.<sup>(8)</sup> Diagonal bracing is not required, nor is building paper, except under stucco.<sup>(4)</sup>

2. **Siding** – Plywood siding shall be (specify appropriate grade and style):<sup>(12)</sup>

- APA RATED SIDING EXT, or
- APA MEDIUM DENSITY OVERLAY (MDO) EXT.

Spacing of 1/8 inch is recommended at panel ends and edges, unless otherwise indicated by the panel manufacturer. Nail panel siding 6 inches o.c. along panel edges and 12 inches o.c. at intermediate supports with 6d non-staining<sup>(9)</sup> box, casing or siding nails for panels 1/2 inch and less, and 8d for greater thicknesses.<sup>(8)</sup>

Nail lap siding installed over nailable panel or lumber sheathing 8 inches o.c. along bottom edge, unless otherwise recommended by manufacturer. When installed direct to studs, nail lap siding at each stud with 6d nonstaining<sup>(9)</sup> box, casing, or siding nails for siding up to 1/2 inch thick, and 8d for thicker panels.

If siding is applied over non-structural sheathing, use next regular nail size. Use

nonstaining box nails for siding installed over foam insulation sheathing.

Diagonal bracing is not required with panel siding.

Building paper may be omitted if vertical joints in plywood panel siding are shiplapped, or covered with battens (except for grooved siding applied horizontally), or if siding is installed over panel sheathing. All panel edges should be sealed. For panels to be painted, sealer can be paint primer; for panels to be stained, sealer should be a water-repellent preservative compatible with the finish.

3. **Soffits** Soffits shall be (specify appropriate grade and style):<sup>(16)</sup>

- APA A-C EXT
- APA RATED SIDING 303 EXT,<sup>(12)</sup>
- or APA MEDIUM DENSITY OVERLAY (MDO) EXT.

Nail 6 inches o.c. at supported panel edges and 12 inches o.c. at intermediate supports, with 6d nonstaining<sup>(9)</sup> box, casing, or siding nails for panels 1/2 inch and less, and 8d for panels up to 3/4 inch thick.

## E. TREATED PLYWOOD

### 1. Fire-Retardant-Treated Plywood –

All plywood shall be pressure-treated in accordance with American Wood Preservers Association (AWPA) Standard C27 with an approved (low hygroscopic Interior Type A) (Interior Type B)

(Exterior Type) fire retardant. Each panel shall be labelled or marked by an approved independent testing agency. After treatment, plywood shall be dried to an average moisture content of 15 percent or less.

Plywood shall be all-veneer APA RATED SHEATHING (or better, depending on appearance desired) EXP 1 or EXT. **Note: Span Ratings and load capacities are based on untreated panels, and may not apply following fire-retardant treatment. Obtain structural performance characteristics of FRT panels from the company providing the treatment and redrying service.**

### 2. Preservative-Treated Plywood –

Treated plywood for (state application) shall be pressure-treated in accordance with AWWA Standard C9 with (creosote) (pentachlorophenol) (water-borne) preservatives, as required for (coastal water) (wood foundation) (ground contact) (above ground) exposure. Plywood treated with water-borne preservatives shall be dried after treatment to a moisture content of 18 percent or less.

(10) Other code-approved fasteners may be used.

(11) Major model building codes accept 12 inches spacing with glue but some local codes may require closer spacing. When panels greater than 3/4 inch are used in glued floors, use same fastener schedule as for nailed-only construction.

(12) See pages 10-12, or for more information, APA Product Guide: Performance Rated Sidings, E300, and APA Design/Construction Guide: Residential & Commercial, E30.

(13) This step may not be necessary under some carpet and structural flooring products – check with flooring manufacturer.

(14) Design and fabrication specifications for plywood box beams, stressed-skin panels, curved panels, sandwich panels and all-plywood beams are available from APA.

All treated plywood used in the Permanent Wood Foundation system (PWF) shall be marked by an approved inspection agency certified to inspect preservative-treated wood, indicating compliance with the treating, drying, retention and penetration requirements of the AWWPA Standard C22, or equivalent code-approved preservative-treating and quality control requirements.

Plywood shall be all-veneer APA RATED SHEATHING (or better, depending on appearance desired) EXP 1 marked APA Series V-600, or EXT marked APA Series V-611. **Note: For PWF applications, panels marked PS 1 are required.**

## F. GLUED PLYWOOD COMPONENTS

1. **General** – All plywood components shall be fabricated in accordance with the appropriate Fabrication Specification.<sup>(14)</sup> Each original plywood panel shall bear the appropriate trademark of APA – *The Engineered Wood Association*. Glue shall be of resorcinol or phenolic resin base (for outdoor exposure), or casein with a mold inhibitor (for indoor exposure).

## CONCRETE FORMWORK (CSI Division 3)

### A. MATERIALS

1. **Forms** – Plywood concrete forms shall be (specify appropriate grade):  
APA B-B PLYFORM CLASS I EXT,  
APA HIGH DENSITY OVERLAY (HDO) PLYFORM CLASS I EXT  
APA STRUCTURAL I B-B PLY-FORM EXT

APA STRUCTURAL I HIGH DENSITY OVERLAY (HDO) PLYFORM EXT, or APA B-C EXT.

Use plywood thickness sufficient to support concrete at temperature and rate poured;<sup>(15)</sup> securely brace and shore forms to prevent displacement and to safely support construction loads.

## PAINTING<sup>(12)</sup> (CSI Division 9)

### A. PREPARATION OF SURFACES

1. **Exterior Panels** – Panels to be exposed outdoors shall have all edges sealed. With paint, sealer may be a liberal coat of exterior house paint primer. With stain, seal with water-repellent preservative compatible with finish coat.

2. **All Panels** – Surface shall be clean, dry and free of loose wood fibers. Holes and cracks shall be filled with putty or plastic wood (except for rustic type panels). After dry, sand lightly in the direction of the grain of face veneer or texture to match existing surfaces.

Any tree pitch or sap spots shall be first touched up with a sealer where the finish is paint.

### B. APPLICATION OF FINISH

(Specify by brush, roller, or spray; brush application of the first coat gives best performance.)

**Exterior Panels – Painted** First coat: Exterior stain-blocking primer as recommended by manufacturer of finish coat. (May be tinted.) Apply quantity as recommended by paint manufacturer.

Second coat: Top-quality exterior all-acrylic latex house paint designed for use with primer; color as selected. Two topcoats provide better performance.

**Exterior Panels – Stained** First coat: Top-quality exterior penetrating semitransparent oil stain where grain showthrough is desired<sup>(18)</sup>; or heavily pigmented solid-color oil or latex stain where grain is to be masked<sup>(19)</sup>; color as selected. Apply in one or two coats as recommended by manufacturer.

Use stain-blocking primer with light-colored solid-color latex stains.

**Interior Panels – Painted** First coat: Stain-blocking primer as recommended by manufacturer of finish coat.

Second coat: Flat, semi-gloss or gloss topcoat designed for use with primer; color as selected. Use two topcoats if needed to cover.

**Interior Panels – Color Tone** First coat: Stain and companion sealer mixed to selected color (or sealer, then stain applied separately).

Second coat: Interior satin varnish (additional coats can be applied as desired for depth of luster).

**Interior Panels – Light Stain** First coat: Pigmented resin sealer (wiped off when tacky).

Second coat: Clear resin sealer.

Third coat: Tinted undercoat; thin enamel; pigmented sealer; or light stain applied thinly and wiped to the desired color depth; color as selected.

Fourth coat: Interior satin varnish (additional coats can be applied as desired for depth of luster).

(15) Thickness recommendations are contained in *APA Design/Construction Guide: Concrete Forming*, V345.

(16) Open soffits or roof sheathing exposed on the underside may be any panel classed Exposure 1 where appearance is not a major consideration.

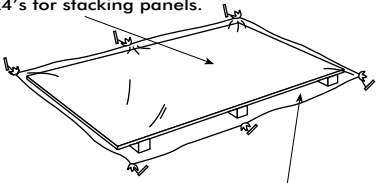
(17) Specify veneer-faced STURD-I-FLOOR with “sanded face” when resilient flooring is to be applied. Otherwise, an additional layer of underlayment is recommended when resilient flooring is to be applied over STURD-I-FLOOR. (See C.3 for recommended grades.)

(18) Semitransparent stains may be used on plywood face grades 303-OC, 303-NR or 303-6-W. Other 303 face grades should not be finished with semitransparent stains unless specifically recommended by the panel manufacturer.

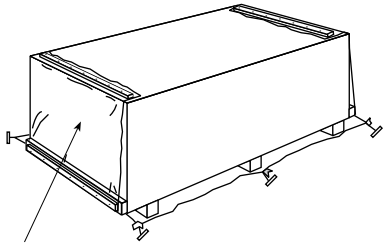
(19) Only latex formulations are recommended on APA 303-SR and 303-NR grades of plywood siding.

## STORAGE AND HANDLING

Build platform of cull panel and scrap lumber 4x4's for stacking panels.



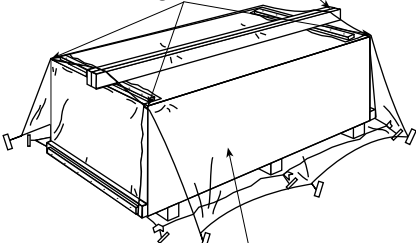
Stretch plastic film over platform to block passage of ground moisture.



Nail film to top panel and drape over ends for protection against driving rain. Weight lower end with 2x4.

Lay two 2x4's on top of stack.

Pad corners with rags.



Stretch film over stack and secure to tie-down stakes.

Like all building materials, APA trademarked structural wood panels should be properly stored, handled and installed to assure superior in-service performance.

Protect the edges and ends of panels, especially tongue-and-groove floor and ship-lapped siding panels. Place panels to be moved by forklift on pallets or bunks when received to avoid damage by fork tines.

Panels to be transported on open truckbeds should be covered with standard tarpaulins. For open railcar shipment, use "lumber wrap" to avoid extended weather exposure.

Store panels whenever possible under roof, especially if they won't be used soon after received. Keep sanded and other appearance grades away from open doorways, and weight down the top panel in a stack to avoid any possible warpage from humidity. If moisture absorption is expected, cut steel banding on panel bundles to prevent edge damage.

Panels to be stored outside should be stacked on a level platform supported by 4x4 stringers or other blocking. Never leave panels or the platform in direct contact with the ground. Use at least three full-width supports along the eight-foot length of the panel – one centered and the others 12 to 16 inches from each end.

Cover the stack loosely with plastic sheets or tarps. Anchor the covering at the top of the stack, but keep it open and away from the sides and bottom to assure good ventilation. Tight coverings prevent air circulation and, when exposed to sunlight, create a "greenhouse" effect which may encourage mold formation.

## INSTALLATION

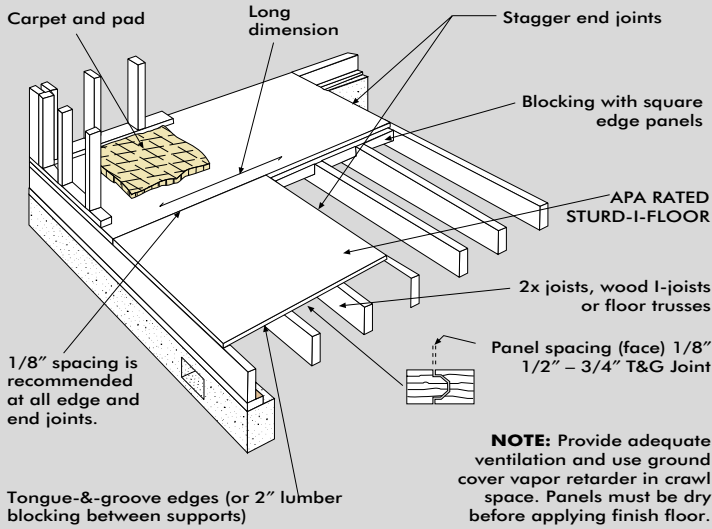
While APA trademarked structural wood panels exhibit excellent dimensional stability, panel edges and ends should be spaced slightly when installed to allow for any expansion caused by moisture absorption. Recommended spacings are given with the illustrations.

APA Rated Siding, in addition, should be edge sealed (both blind and exposed edges) to minimize the possibility of surface checking, water staining or mildew. Sealing is easiest when panels are stacked. Reseal new edges of panels cut to fit. The type of sealant recommended depends on the finish treatment to be used on the siding.

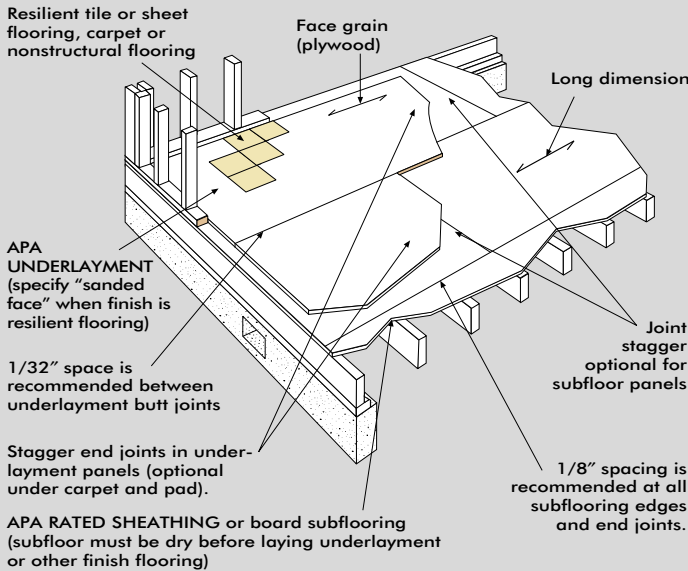
Once installed, protect panels as soon as possible. For example, protect sub-flooring by installing and sheathing walls and roofs; protect roof sheathing with roofing felt or finish roofing material; protect underlayment with plastic sheeting, cardboard or heavy kraft paper prior to installing finish flooring, etc. Enclosing the structure as quickly as possible, keeping panels dry before attaching other materials (such as underlayment or finish flooring), and assuring adequate ventilation, particularly in attics and crawl spaces, can prevent many costly problems and callbacks.

For complete residential and commercial application recommendations, see *APA's Design/Construction Guide: Residential & Commercial*, Form E30.

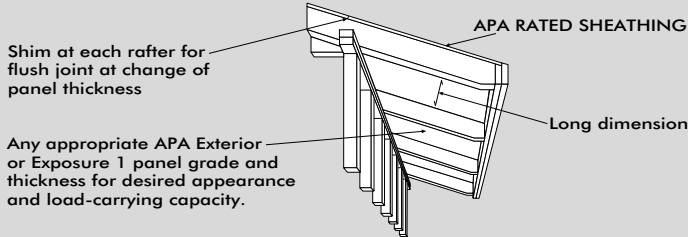
**APA RATED STURD-I-FLOOR  
(Single Floor)**



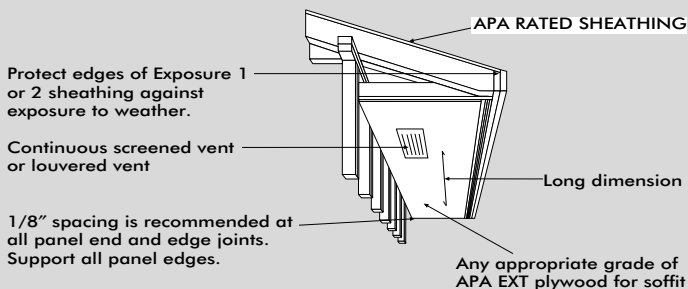
**APA UNDERLAYMENT OVER  
APA RATED SHEATHING SUBFLOORING  
(Double Floor)**



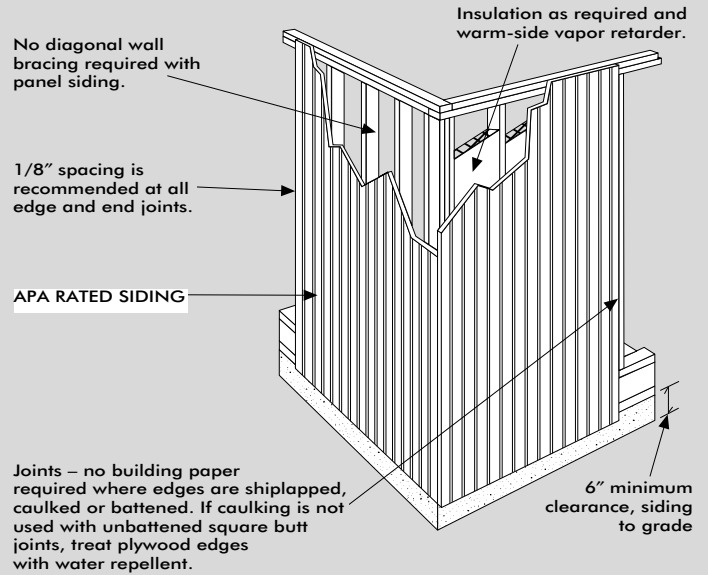
**OPEN SOFFITS**



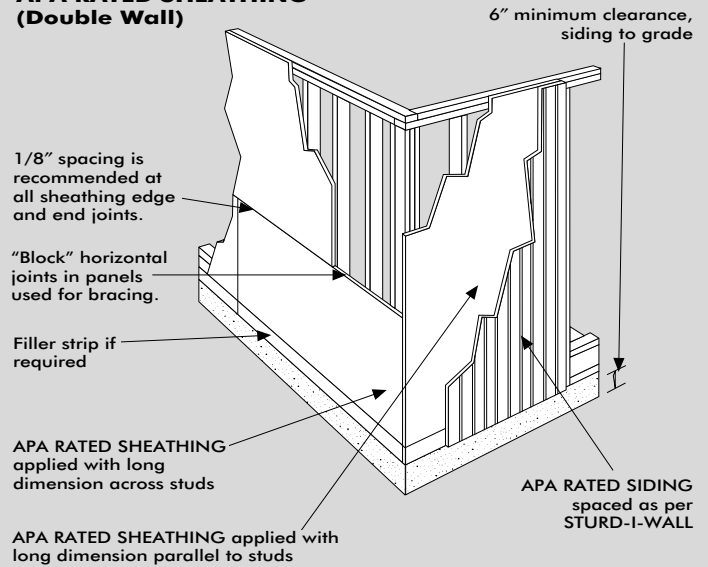
**CLOSED SOFFITS**



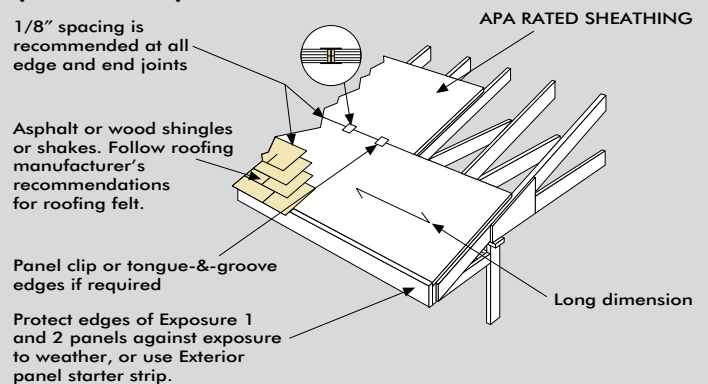
**APA STURD-I-WALL  
(APA RATED SIDING Direct to Studs or over  
Nonstructural Wall Sheathing)**



**APA RATED SIDING OVER  
APA RATED SHEATHING  
(Double Wall)**



**APA RATED SIDING OVER  
APA RATED SHEATHING  
(Double Wall)**



**NOTE:** For pitched roofs, wear skid-resistant shoes when installing roof sheathing. Place screened surface or side with skid-resistant coating up, if oriented strand board panels are used. Cover sheathing as soon as possible with roofing felt for extra protection against excessive moisture prior to roofing application.

## METHOD OF ORDERING

### APA PERFORMANCE RATED PANELS

Designate thickness, APA trademark, grade, Span Rating, exposure durability classification, dimensions, number of pieces. For example:

15/32" APA RATED SHEATHING  
32/16, Exposure 1, 48" x 96", 100 pcs.

23/32" APA RATED STURD-I-FLOOR  
24 oc, Exterior, 48"<sup>(1)</sup> x 96", 100 pcs.  
(Note "square edge" or "tongue-and-groove" as desired.)

### APA RATED SIDINGS

Designate thickness, APA trademark, face grade (for APA Rated Siding-303), Span Rating, texture, pattern, dimensions, number of pieces. For example:

19/32" APA RATED SIDING,  
303-18-W, 16 oc, rough-sawn  
Texture 1-11, grooves 4" oc,  
48" x 96", 100 pcs. (Note  
manufacturer's trade name if desired.)

### APA SANDED AND TOUCH-SANDED PANELS

Designate thickness, APA trademark, grade, Group number<sup>(2)</sup>, exposure durability classification, dimensions, number of pieces. For example:

3/8" APA A-A, Group 1, Exterior,  
48" x 96", 100 pcs.

3/8" APA Underlayment, Group 1,  
Exposure 1, 48" x 96", 100 pcs.  
(Note "sanded face" if used under resilient flooring, or see pages 13-14 for additional grades.)

### CONCRETE FORM

Designate thickness, APA trademark, Class, dimensions, number of pieces. For example:

5/8" APA B-B PLYFORM Class I,  
48" x 96", 100 pcs. (B-B Plyform panels are manufactured only as Exterior panels and are mill-oiled unless otherwise specified.)

### OVERLAID PANELS

Designate thickness, APA trademark, grade, Group number, dimensions, number of pieces. For example:

1/2" APA MEDIUM DENSITY OVERLAY (MDO), or (APA 303-0L MDO in the case of overlaid panels produced under the APA RATED SIDING-303 manufacturing specification), Group 1, 48" x 96" 100 pcs. (Any special requirements, such as only one side overlaid, or surface texture or weight of surfacing material, should be stated after the standard specification.)

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(1) Most tongue-and-groove panels are manufactured with a 47-1/2-inch net face width, although manufacturing practices vary. Check with your supplier.

(2) Underlayment and C-C Plugged panels 1/2" and thicker are span rated and do not contain species group number in trademark. Designate Span Rating.

## GRADE AVAILABILITY

Some panel grades, thicknesses, Span Ratings, or species may be difficult to obtain in some areas. Check with your supplier for availability or include an alternate panel in specifications. Standard panel dimensions are four feet by eight feet, although some mills also produce panels nine or ten feet or longer.

## ADDITIONAL INFORMATION

For additional information about APA trademarked panel products or applications, contact the APA – *The Engineered Wood Association*, PO Box 11700, Tacoma, Washington 98411-0700, or the nearest APA regional field office listed on the back cover. A complete listing of other APA product and application guides is contained in the Association's **Publications Index**, Form B300.

## ABOUT APA

The APA – *The Engineered Wood Association* is a nonprofit trade association whose member mills produce approximately 80 percent of the structural wood panel products manufactured in the United States and a significant percentage of panels produced in Canada.

Founded in 1933 as the Douglas Fir Plywood Association and widely recognized today as a leader in the structural wood panel industry, APA performs numerous functions and services on behalf of panel product users, specifiers, dealers, distributors, schools and universities and other key groups.

Among the most important of these functions is quality inspection and testing. APA maintains five quality testing laboratories in key producing regions, including a 37,000-square foot research center at Association headquarters in Tacoma, Washington.

But quality validation is only one of APA's many functions. We also:

- Operate the most sophisticated program for basic panel research in the world.
- Maintain an international network of field representatives to assist panel product users, specifiers, dealers, distributors and other segments of the trade.
- Conduct informational buyer and specifier seminars and provide dealer and distributor sales training.
- Publish a vast inventory of publications on panel grades, applications, design criteria and scores of other topics.
- Advertise and publicize panel product systems and applications in national trade and consumer magazines.
- Sponsor annual design competitions for architects, builders, students and do-it-yourself home craftsmen.
- Work to secure acceptance of structural wood panel products and applications by code officials, insuring agencies and lending institutions.
- Develop and maintain performance and industry product standards.
- Conduct in-depth market research and development programs to identify and penetrate new panel markets in the U.S. and abroad.
- Work in conjunction with other wood product industry organizations on solutions to problems of common concern.

Always insist on panels bearing the **mark of quality** – the APA trademark. Your APA panel purchase or specification is your highest assurance of quality. It is also an investment in the many trade services and programs that APA undertakes on your behalf.

*The product use recommendations in this publication are based on APA – The Engineered Wood Association's continuing programs of laboratory testing, product research, and comprehensive field experience. However, because the Association has no control over quality of workmanship or the conditions under which engineered wood products are used, it cannot accept responsibility for product performance or designs as actually constructed. Because engineered wood product performance requirements vary geographically, consult your local architect, engineer or design professional to assure compliance with code, construction, and performance requirements.*

We have field representatives in most major U.S. cities and in Canada who can help answer questions involving APA trademarked products. For additional assistance in specifying APA panel products, get in touch with your nearest APA regional office. Call or write:

**Western Region**

440 Northlake Center, Suite 211  
Dallas, Texas 75238-4418  
(214) 348-0643  
Fax: (214) 348-3424

**Eastern Region**

2130 Barrett Park Drive, Suite 102  
P.O. Box 440069  
Kennesaw, Georgia 30144-3681  
(404) 427-9371  
Fax: (404) 423-1703

**International Marketing  
Division**

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(206) 565-6600  
Fax: (206) 565-7265  
(Offices: Antwerp, Belgium; London,  
United Kingdom; Madrid, Spain;  
Hamburg, Germany; Mexico City, Mexico;  
Tokyo, Japan.) For Caribbean/Latin America,  
contact headquarters in Tacoma.

**Do the right thing right.™**

**Wood is good.** It is the earth's natural, energy efficient and renewable building material.

**Engineered wood is a better use of wood.**  
It uses less wood to make more wood products.

That's why using APA trademarked plywood, oriented strand board and APA EWS laminated beams is the right thing to do.

**A P A**

*The Engineered Wood Association*

P.O. Box 11700  
Tacoma, Washington 98411-0700  
(206) 565-6600 / Fax (206) 565-7265

Form No. J20G/Revised August 1992/0200

