

Decking

Introduction

Plank Decking

Plank decking is tongue and groove lumber at least 38mm (1-1/2") thick, with the flat face laid over supports such as beams or purlins to provide a structural deck for floors and roofs. It is used where the appearance of the decking is desired as an architectural feature, or where the mass of decking is required to add to the fire safety of Heavy Timber construction.

Individual planks can span simply between supports, but are generally random lengths spanning several supports for economy, and to take advantage of increased stiffness.

Wood species commonly used for plank decking include western red cedar, Douglas fir, western hemlock, and various species of the Spruce-Pine-Fir group. Cedar is often selected for exposed applications where its natural durability is an added advantage to its attractiveness.

The general term "decking" is used to describe both tongue and groove lumber laid flat (plank decking), and lumber laid on edge (laminated decking).

Laminated decking is dimension lumber placed on edge so that each member acts like a joist, and adjoining pieces are usually nailed to each other to create a nail-laminated load sharing unit.

Laminated decking was once a popular method of building construction where a heavy floor was required and may in fact have some building applications where an industrial type floor is required.







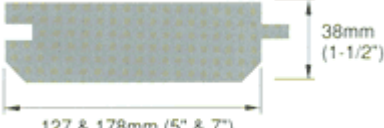
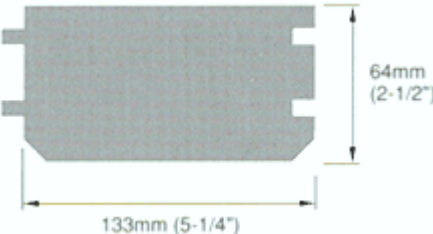
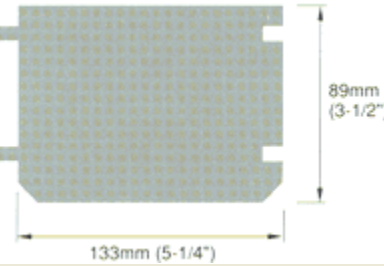
Sizes and Shapes

Plank decking is produced in three thicknesses; 38mm (1-1/2'), 64mm (2-1/2"), and 89mm (3-1/2"). The 38mm (1-1/2") decking has a single tongue and groove and is available in 127mm (5") or 178mm (7") widths.

The two thicker sizes are double tongue and groove and usually available only in 133mm (5-1/4") face width. These sizes may be ordered with pre-drilled 6mm (1/4") holes at 760mm (30"0 spacings so that each piece may be nailed to the adjacent piece with 200mm (8") No.3 gauge decking spikes.

All decking is V-grooved on the face which is the best in appearance.

The sizes, face patterns, and suggested fastening details are shown below.

Faces, Sizes and Nailing for Plank Decking		
38mm (1-1/2") Decking	64 and 89mm (2-1/2" and 3-1/2") Decking	
Faces		
 <p>Exposed face (V-joint)</p>	 <p>Regular V-joint</p>	 <p>Eased joint</p>
	 <p>Wire brushed</p>	 <p>Grooved 10mm (3/8") grooves</p>
	 <p>Accoustical 3mm (1/8") grooves</p>	
Sizes		
 <p>38mm (1-1/2")</p> <p>127 & 178mm (5' & 7")</p>	 <p>64mm (2-1/2")</p> <p>133mm (5-1/4")</p>	 <p>89mm (3-1/2")</p> <p>133mm (5-1/4")</p>
Nail Patterns		

Grades

Plank decking is available in two grades, Select and Commercial, based on the appearance of the best face as shown in Table 1 below.

Select grade is used for high quality construction where high strength and fine appearance for exposed locations are desired.

Commercial grade contains more growth characteristics and more manufacturing defects than Select grade. Commercial grade is chosen when appearance and strength are less critical such as in industrial buildings.

Table 1: Plank Decking Grades			
Grade	Principal Uses	Size	
		metric	Imperial (actual)
Select	For roof and floor decking where strength and fine appearance are required.	38, 64 and 89mm thick 127mm and wider	1-1/2", 2-1/2", and 3-1/2" thick 5"and wider
Commercial	For roof and floor decking where strength is required but appearance is not so important. Grade contains pieces that do not meet Select Grade requirements.	38, 64 and 89mm thick 127mm and wider	1-1/2", 2-1/2", and 3-1/2" thick 5"and wider

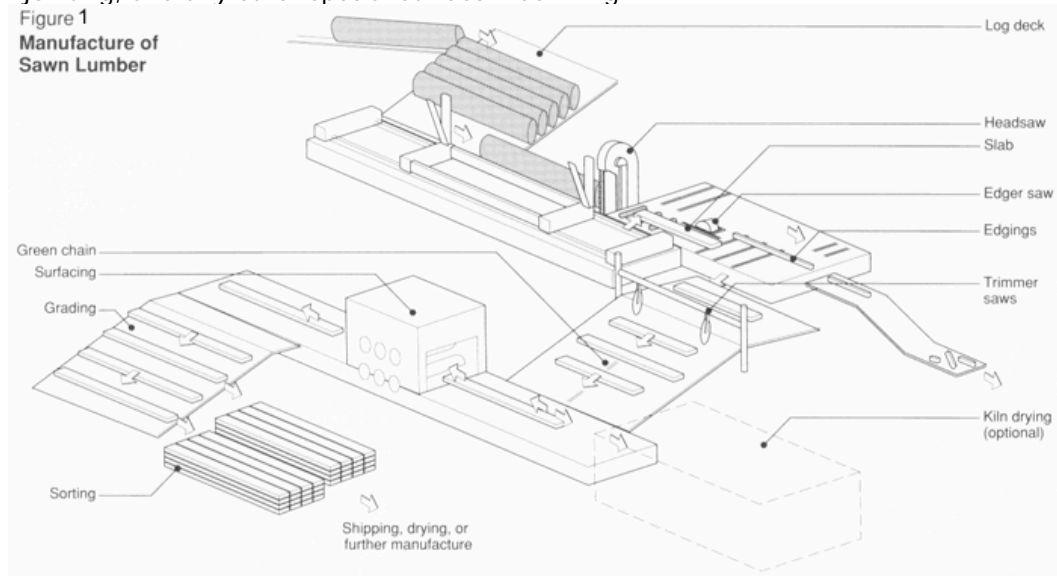
The permitted characteristics for Select and Commercial grades are shown in Table 2 below.

Table 2: Permitted Characteristics for Select and Commercial Grade Plank Decking

Category	Permitted Select Grade Characteristics	Permitted Commercial Grade Characteristics
Growth	<ul style="list-style-type: none"> • medium stained wood 	<ul style="list-style-type: none"> • stained wood
	<ul style="list-style-type: none"> • small holes, equivalent to chipped knots 	<ul style="list-style-type: none"> • holes, 25mm (1")
	<ul style="list-style-type: none"> • slope of grain not to exceed 1 in 10 	<ul style="list-style-type: none"> • slope of grain not to exceed 1 in 8, full length
	<ul style="list-style-type: none"> • medium bark pockets 	<ul style="list-style-type: none"> • bark or pitch pockets
	<ul style="list-style-type: none"> • sound and tight knots on exposed face 	<ul style="list-style-type: none"> • unsound wood and/or peck not exceeding approximately 1/3 of any face
	<ul style="list-style-type: none"> • knots well spaced, not larger than approximately 60mm (2-3/8") in diameter permitted both wide faces for 38 x 127mm (2" x 6" nom.) and 83mm (3-1/4") for 38 x 178mm (2" x 8" nom.) 	<ul style="list-style-type: none"> • knots well spaced, not larger than approximately 73mm (3") permitted on both wide faces for 38 x 127mm (2" x 6" nom.) and 95mm (3") for 38 x 178mm (2" x 8" nom.)
	<ul style="list-style-type: none"> • in occasional pieces, unsound knots, if tight and not exceeding 38mm (1-1/2") in diameter, are permitted if medium checks not through the piece and do not exceed 2 in a 4m (13') length or equivalent smaller. 	<ul style="list-style-type: none"> • shake not serious • occasional crook medium
	<ul style="list-style-type: none"> • spike and narrow face knots are permitted if judged to have no more effect on strength than other knots. 	<ul style="list-style-type: none"> • spike and narrow knots are permitted if judged to have no more effect on strength than other knots.
	<ul style="list-style-type: none"> • chipped and/or broken out knots not larger than approximately 19mm (3/4") in diameter are permitted if not through the piece and do not exceed 2 in a 4m (13') length. 	<ul style="list-style-type: none"> • chipped and/or broken out knots or portions of knots not larger than approximately 38mm (2"nom.) in diameter are permitted if not through the piece.
	<ul style="list-style-type: none"> • on unexposed face and edges, hit and miss skips or wane approximately 1/3 of the face width, pecky spots in narrow streaks, skips 10 percent of exposed face in occasional pieces and other characteristics not interfering with the intended use are permitted. 	<ul style="list-style-type: none"> • on unexposed face and edges wane approximately 1/3 of the face and other characteristics not interfering with the intended use are permitted.
Seasoning	<ul style="list-style-type: none"> • medium checks 	<ul style="list-style-type: none"> • checks
	<ul style="list-style-type: none"> • occasional short splits 	<ul style="list-style-type: none"> • splits approximately 1/6 of length
	<ul style="list-style-type: none"> • occasional light crook 	<ul style="list-style-type: none"> • wane approximately 1/6 of the face width
Manufacturing	<ul style="list-style-type: none"> • tongue 2mm (1/8") narrow on occasional pieces 	<ul style="list-style-type: none"> • tongue 2mm (1/16th) narrow
	<ul style="list-style-type: none"> • medium torn grain 	<ul style="list-style-type: none"> • torn grain
	<ul style="list-style-type: none"> • hit and miss skips 	<ul style="list-style-type: none"> • hit and miss skips

Manufacturing and Ordering

Plank decking is a solid sawn lumber product manufactured as in the figure below, except that unlike dimension lumber and timbers, additional manufacturing is necessary to provide the tongue and groove profile, V-jointing, and any other special surface machining.



Moisture Content

Plank decking is generally specified, dressed, and supplied S-Dry (moisture content 19 percent or less at time of surfacing). It is generally kiln dried to an average moisture content of 15 percent to minimize on site shrinkage or warping.

Ordering

Plank decking is usually purchased in random lengths ranging from 1.83m (7') to 6.10m (20'). Longer lengths may be specifically ordered. While decking may be ordered in specific lengths, designers should expect limited availability and extra costs. A typical specification for random lengths is as follows:

- 90% of planks 3.0m (10') and longer
- 40 percent to 50 percent of planks 4.9m (16') and longer

For both 64 and 89mm (2-1/2" and 3-1/2") decking, designers should check that the decking lengths are adequate for spans. A rule of thumb is that spans should not be more than about 600mm (2') longer than the length which 40 percent of the decking shipment exceeds. Long lengths may only be available in certain species such as Douglas fir and western red cedar.

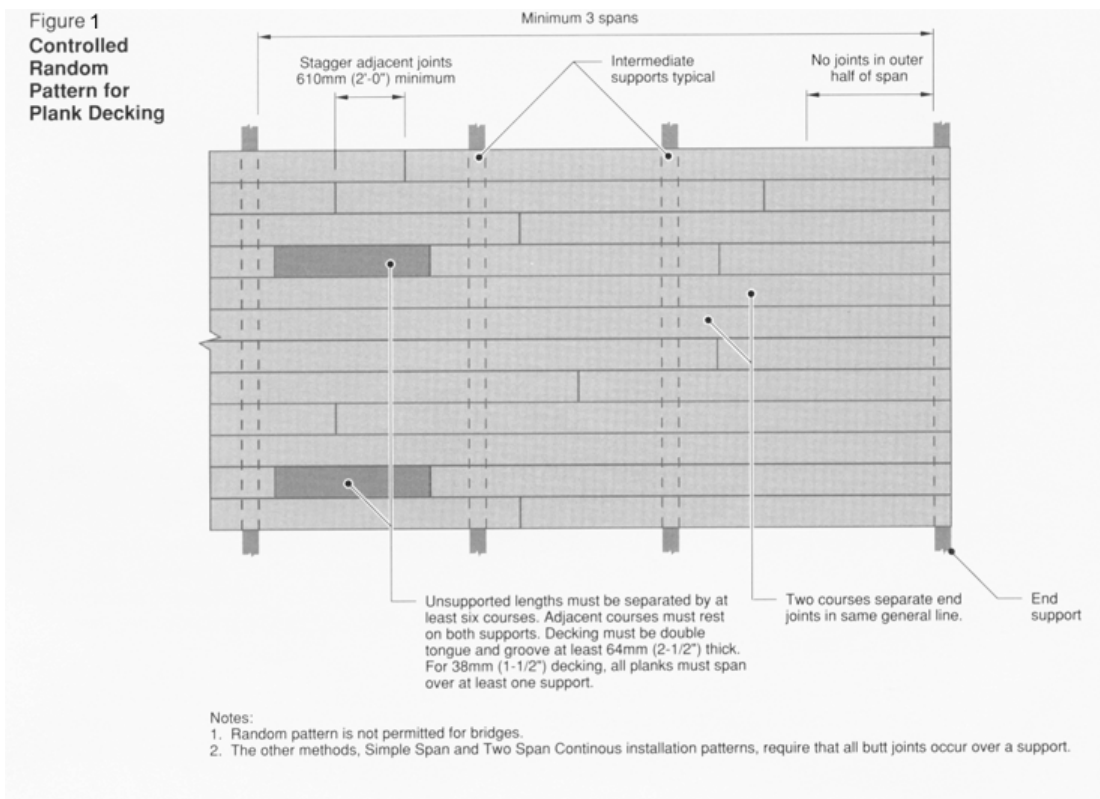
For simple-span or two-span continuous decking, uniform lengths should be specified even though unit material costs will be higher.

Installation

There are three methods of installing plank decking.

The first method, called controlled random, is the most economical because random length material is used. The controlled random pattern is shown in the figure below and consists of the following:

- Each deck must consist of at least 3 spans.
- End joints are not permitted in the outer half of end spans.
- End joints in adjacent courses must be staggered at least 600mm (2').
- Where end joints occur in the same general line, they must be separated by at least two intervening courses.
- In floors and roofs, planks which do not span more than one support must be flanked by courses resting on both supports of that span. They must be separated from the next unsupported plank by at least six courses extending over at least one support (this is only permitted for double tongue and groove planks at least 64mm (2-1/2") thick).



The second method is called Simple Span. All pieces rest on two supports and are the same length. The third method is Two Span Continuous. All pieces rest on three supports and are the same length. Both the latter methods require planks of predetermined length and a consequent cost premium.

Fire Safety

The thickness of plank decking makes it a more fire-resistant material compared to panel and board sheathing. For this reason it is often used in large commercial buildings where fire performance must meet Heavy Timber construction requirements for fire safety and where the superior appearance characteristics of this material are desired.

The Wood Reference Handbook provides further information on building code requirements relating to fire safety and details the minimum size requirements for Heavy Timber construction including minimum thicknesses for decks.

General Guidelines

- Select the species and grade which best combines strength, appearance, and economy for the application.
- Select the layout pattern and the lengths required.
- Allow at least 5% for waste.
- Take measures to protect the decking from excessive wetting during installation.

References

Wood Design Manual, Canadian Wood Council, 2001.

Standard Grading Rules for Canadian Lumber, National Lumber Grades Authority, 2000.