

# **Wood Projects Outdoors**

## **Post Hole Specifications**

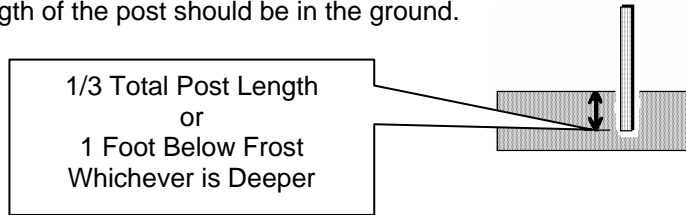
**&**

## **Deck Span Tables**

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## Building Fences

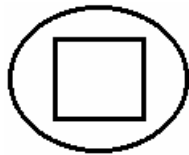
The depth of the fence posts into the ground must be at least one foot below the frost level for your region. As well, one third of the total length of the post should be in the ground.



This means that in mild regions the posts will be well below frost simply because of their length. In regions with deep frost the posts may have more than one third of their length in the ground.

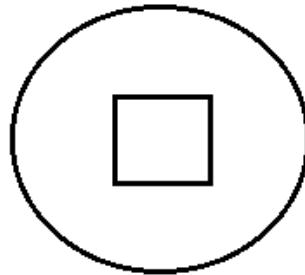
Gate post and end post holes should be filled with concrete for stability.

Intermediate post holes can be packed tightly with dirt.



**Dirt Fill**

**Hole Diameter =  
2 x Post**



**Concrete Fill**

**Hole Diameter =  
3 x Post**

Post holes should be dug with a diameter twice the thickness of the post if it is to be dirt packed, and three times the thickness if it is to be solidified with concrete.

## Using Deck Span Tables

Span tables indicate how large a board must be to "span" or reach across from one point to another without breaking or even without flexing too much. Span tables apply to beams, joists and even to deck boards.

The size of a board depends upon how far it has to reach between supports, what is the load that is going to be on top of it and what kind of wood is used. You can always put things closer together or use larger lumber but what a span table tells you is the maximum distance for the supports of a given piece of lumber.

Here is a set of tables developed specifically for the normal load conditions that you would find for a deck in Canada. (Live load = 40psf, Dead load = 10psf) They are calculated considering using Canadian wood that is S-P-F (Spruce-Pine-Fir) Grade #2 or better pressure treated wood. The use of lumber made from Douglas Fir or Cedar is weaker requiring slightly larger beams and joists, US Southern Pine is slightly stronger.

The closer together two boards (the spacing) the less weight they have to carry as there are more of them to share the load. This is why a 12' span between beams requires a 2x8 joist if the joists are spaced 16" apart but requires a larger 2x10 joist if they are spaced 24" apart. In general you always have a choice between fewer but larger structural members, or a larger quantity of smaller structural members.

Any time a joist or a beam calls for more than one piece of lumber (i.e. 2- 2x10) they should be laminated together with proper nailing. It is of course much easier to choose lumber sizes from the choices offered in the span tables that don't require laminating. Lamination requires more work and more wood but saves in the total thickness of the deck, which could be important for a multiple tier deck.

## Why Two Beam Span Tables?

There are two span tables for beams. Beams near the wall or on the outer edge of a deck are called "Outer Beams" as they are on the extreme edges of the deck. Beams that are towards the middle of a deck are called "Inner Beams" and they carry twice as much weight as Outer Beams and hence have to be much larger. Usually only large decks or multiple tier decks have inner beams.

## **Ledger Boards**

Ledger boards are beams that are attached directly to the wall of the house and the joists are either attached to the ledger board with joist hangers or the joists sit on top of the ledger board. A ledger board serves the same function as a beam, but because it is bolted onto the house it can be much smaller. Generally a ledger board should be a single 2x that is one size larger than the joists attached to it. If your joists are 2x6, the ledger board should be 2x8.

It should be bolted to the wall every 24 inches. Be sure you don't create water leaks into the basement when installing a ledger board.

## **Decking Span Table**

The final deck surface is usually made of 2x4's or 2x6's lying on the face. More recently, wood that has been planed to 1-1/4 thickness and has rounded edges is used for a better looking deck. A 2x6 lying flat can easily span across joists that are spaced 24" apart. A 2x4 lying flat can just span 24" but it is better to use joists spaced 16" apart. Boards 1-1/4" thick should be on joists not more than 16" apart.

## **Overhang**

The deck should not overhang the outer beam by more than 24".

## **Footings and Posts**

There must be a footing under every post to prevent it from sinking into the ground and footings must be a foot below local frost levels to prevent them from lifting. The footing could be as simple as 4" of concrete in the bottom of a hole, or a full concrete column poured into a sono tube. Massive concrete is not needed unless the deck is high off the ground and lateral support against wind or drifting snow is needed or anchoring to a hill side is critical.

Most decks are built with too much concrete, resulting in added costs and the near impossibility of some future modifications. This has historically been done to keep the wooden posts out of the ground and rot free. Today, pressure treated posts rated for "ground contact" can be buried in soil, concrete or gravel without fear of rot.

When posts are stood atop concrete piles, they must be anchored to the concrete with hardware. When posts are long and high off the ground they must be cross braced.

## **Stairs**

Stairs must not be allowed to slop away from the deck as they can become slippery and dangerous. Sitting level or angling very slightly back toward the deck is the safest.

Always have a least one hand rail from the deck top to the ground level to allow someone who needs help to be able to get up or down safely, even when you have an open terrace design.

## **Landscaping**

Build the grade level up below the deck to assure water run-off away from the house. Install a plastic sheet or landscaping cloth to prevent plant growth and hold it in place with dirt or gravel.

## **Fasteners**

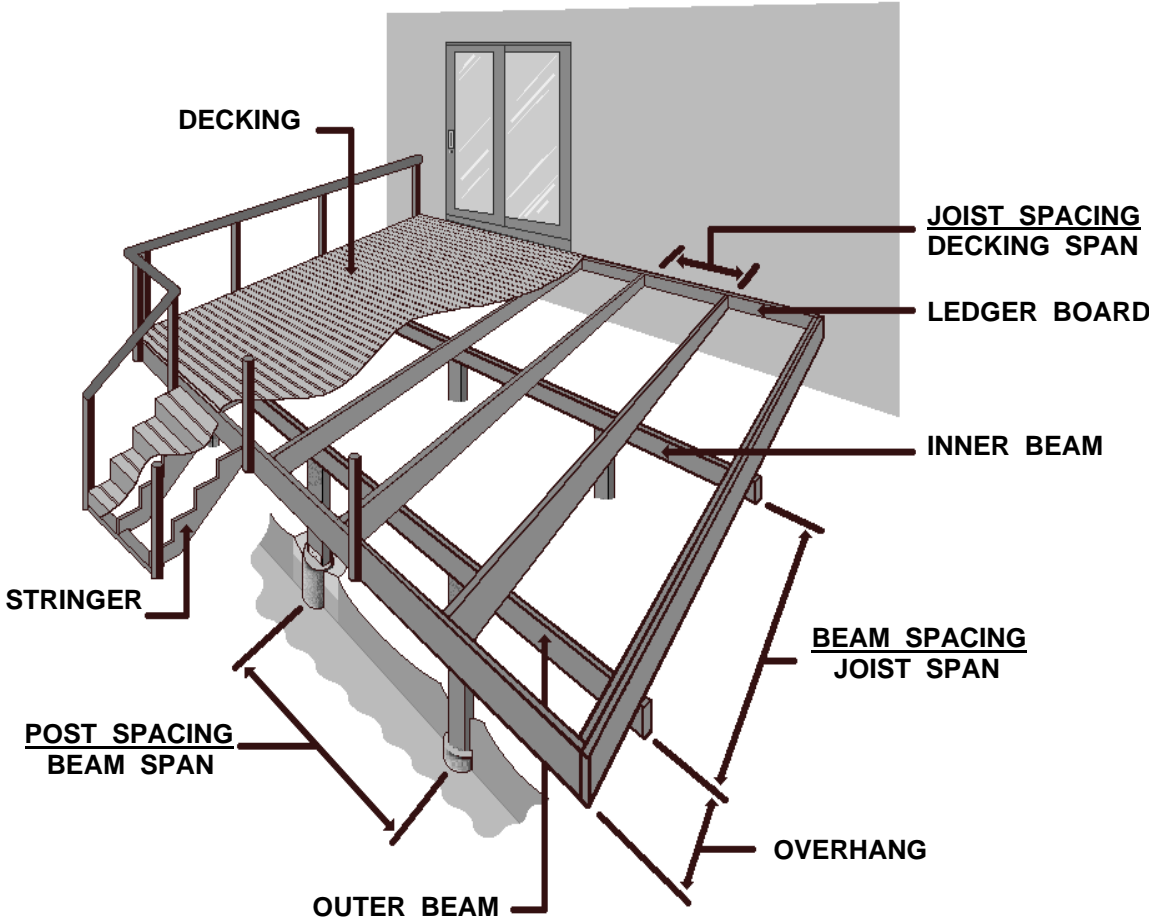
All fasteners and hardware must be rust resistant. Do not use aluminium nails with pressure treated wood. Screws should be used to attach the decking boards for a better looking job as well as to allow easy removal of a single board for repairs or adjustment. Always drill a pilot hole when nailing or screwing at the end of a board to prevent future splitting.

## **Finishing**

Use "end cut treatment" on any cut ends of pressure treated wood as you build. Don't wait and find the cut end nailed into an unreachable corner and untreated. Look for the new formulations that match the colour of the original wood almost perfectly.

Pressure treated wood will not rot, not in your lifetime. Water repellent, which has nothing to do with preventing rot, is recommended to prevent wetting and drying of the surface grain which could result in a "checking" condition. It can be applied as part of a stain, or as a transparent coating. Some pressure treated wood has water repellent applied with the treating process. Throw water on a dry deck. If it beads up, you do not need any protection at this time. If it soaks into the wood, it is time to add a water repellent over this portion of the deck or the entire deck if you like.

# PARTS OF A DECK



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# CANADIAN DECK SPAN TABLES

These tables are conservative tables for mixed wood species found in Canadian Pressure Treated wood (Spruce-Pine-Fir), Cedar is slightly weaker, U.S. Southern Pine is slightly stronger.

For more detailed tables for specific species, refer to the Canadian Wood Council Wood Text Series #7 : "Landscaping With Wood"

The numbers in the shaded portion of the tables are the minimum sizes of lumber (or combination of pieces of lumber laminated together) that are required for a given span and spacing.

## Inner Beam Span Table

		Beam Spacing (ft.)			
		8'	10'	12'	14'
Post Spacing (ft.)	6'	1 - 2 x 8	1 - 2 x 10	1 - 2 x 12	2 - 2 x 8
		2 - 2 x 6	2 - 2 x 8	2 - 2 x 8	
	8'	2 - 2 x 10	2 - 2 x 10	3 - 2 x 10	3 - 2 x 10
		3 - 2 x 8	3 - 2 x 8		
	10'	3 - 2 x 10	3 - 2 x 12	3 - 2 x 12	n/a

## Outer Beam Span Table

		Beam Spacing (ft.)			
		8'	10'	12'	14'
Post Spacing (ft.)	6'	1 - 2 x 8	1 - 2 x 8	1 - 2 x 10	2 - 2 x 8
				2 - 2 x 6	
	8'	1 - 2 x 10	2 - 2 x 8	2 - 2 x 8	2 - 2 x 10
		2 - 2 x 8			
	10'	2 - 2 x 10	2 - 2 x 10	2 - 2 x 12	2 - 2 x 12
		3 - 2 x 8	3 - 2 x 8	3 - 2 x 8	3 - 2 x 10

## Joist Span Table

		Joist Spacing (in.)	
		16"	24"
Beam Spacing (ft.)	8'	1 - 2 x 6	1 - 2 x 6
	10'	1 - 2 x 8	1 - 2 x 8
			2 - 2 x 6
	12'	1 - 2 x 8	1 - 2 x 10
		2 - 2 x 6	2 - 2 x 8
			3 - 2 x 6
	14'	1 - 2 x 10	1 - 2 x 12
		2 - 2 x 8	2 - 2 x 8
		3 - 2 x 6	