



PLANNING, PROPERTY
& DEVELOPMENT
DEPARTMENT

Wood Decks

**Zoning and construction requirements
for open non-sheltered wood decks
for residential dwellings**



General Information 3
Zoning..... 7
Foundations 8
Structural.....11
Design..... 17
Compliance 21
Checklist For Wood Decks 23

Note

The Winnipeg Building By-law is primarily an administrative document that adopts the Manitoba Building Code and related standards to provide construction requirements. Throughout this booklet the Manitoba Building Code will be referred to as the Building Code.

Decks vary in size and area and it is beyond the scope of this publication to deal with each possible situation. The requirements and construction guidelines that follow are provided to assist you in designing and constructing a deck.

Every effort has been made to ensure the accuracy of information contained in this publication. However, in the event of a discrepancy between this publication and the City of Winnipeg Building By-law, the By-law will take precedence.

General Information

Do I require a building permit for a deck?

Yes! A building permit is required for any deck which is higher than 600 mm (24 in.) above ground level or **ANY** deck which will eventually support an enclosed structure with a roof such as a sun room, family room, etc.

What if the deck is not attached to my house, do I still need a building permit?

Regardless of whether or not the deck is attached to the house or any other structure on the property, a building permit is required, as noted above.

Where can I obtain a building permit?

Permits may be obtained by submitting the required information to the Planning, Property and Development Department, on the main floor, Unit 31 - 30 Fort Street.

Are overhead power supply conductors or Hydro meters a cause for concern?

YES! If you plan to build a deck beneath overhead power supply conductors, a minimum clearance of 3.5 m (11 ft. 6 in.) must be maintained between the deck surface and the conductors. If the deck is to be installed beneath a Hydro meter, it may be necessary to relocate the meter to maintain the proper meter height. For more information contact your local Manitoba Hydro District Operating Centre at the phone number listed on your Manitoba Hydro bill.

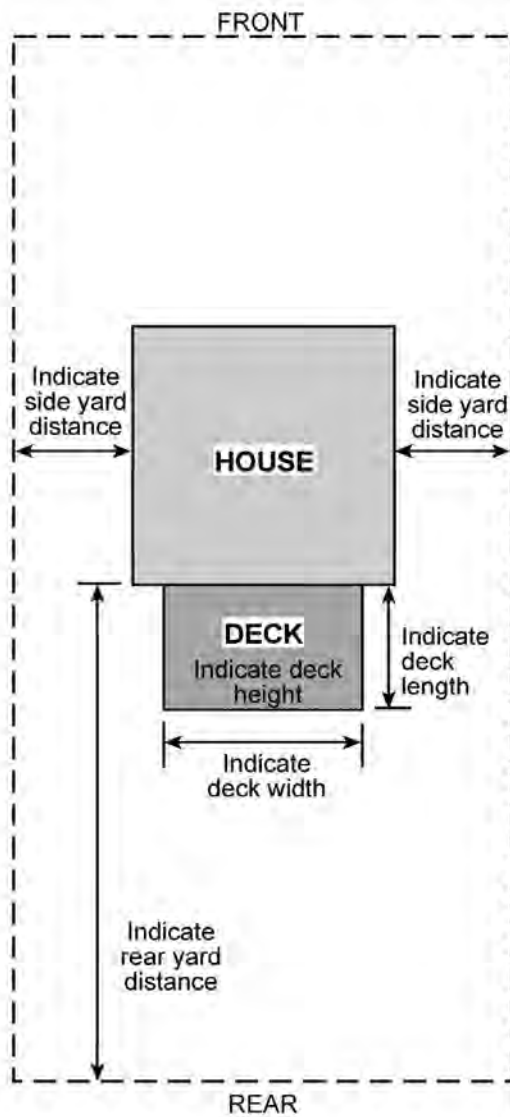
What information do I have to bring with me in order to make application for a building permit?

1. Two (2) copies of a site plan that needs to include street names and lot dimensions, location of all buildings/structures on the property, dimensions (length, width, height or depth) of proposed structure, dimensions of proposed structure in relation to property lines and to other existing structures if applicable).

NOTE: In the event that these dimensions are not clear or represent non-compliance with pre-existing structures, the City may require a current Building Location Certificate (BLC) sealed by a registered land surveyor.

2. Two (2) copies of the construction and elevation plans detailing how the deck will be constructed.
3. A completed copy of the “Check List for Wood Decks” found at the back of this brochure.
4. The information on the checklist must match your permit drawings.

FIGURE 1 - TYPICAL SITE PLAN



What do the construction and elevation plans have to indicate?

The construction plans must show the overall size of the deck, the size and spacing of the beams, posts, and deck joists, the species and grade of the wood material being used, (eg. SPF #2; species - spruce, grade - #2) the type of foundation you have chosen to support the deck and the location of any stairs leading to or from the deck. See **FIGURE 2**.

The elevation plan must show the height of the deck floor above finished ground level at its highest point and the height and type of guardrail being used around the perimeter of the deck.

See **FIGURE 3**.

FIGURE 2 - TYPICAL CONSTRUCTION PLAN

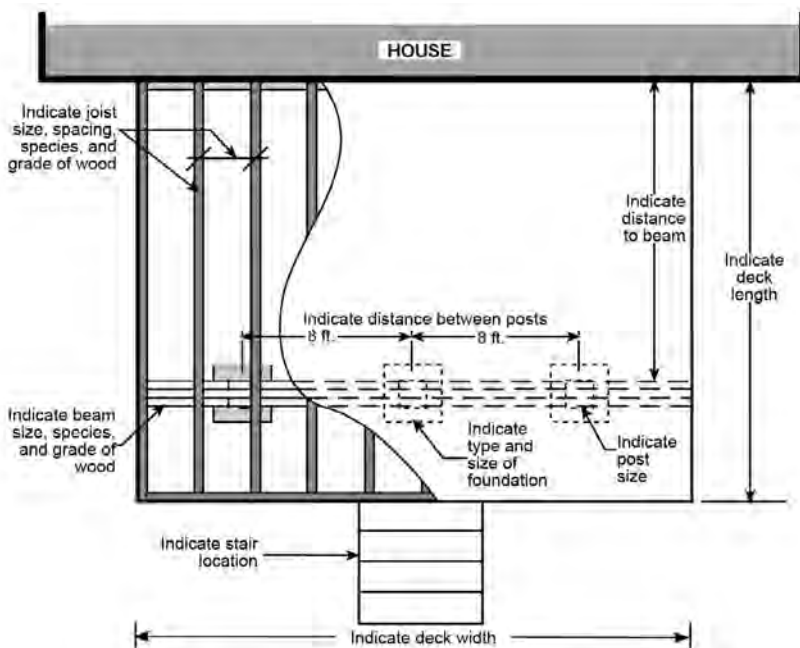
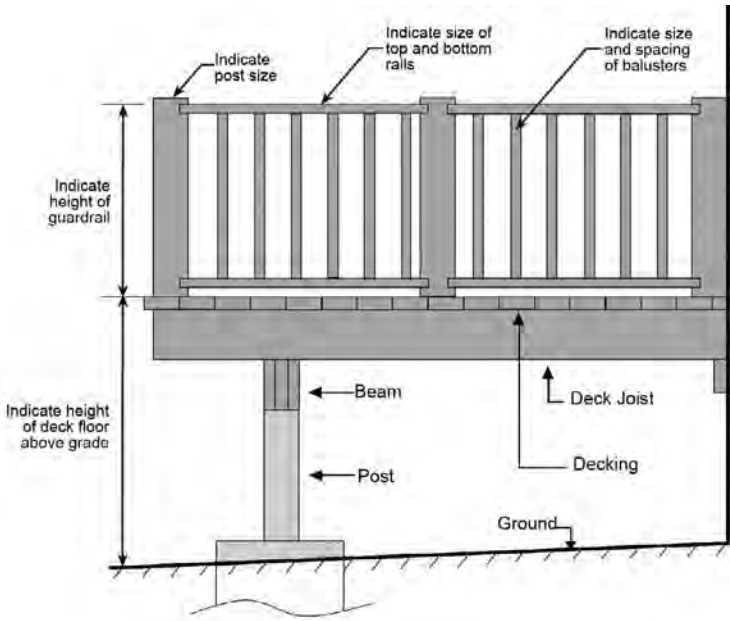


FIGURE 3 - TYPICAL DECK ELEVATION PLAN



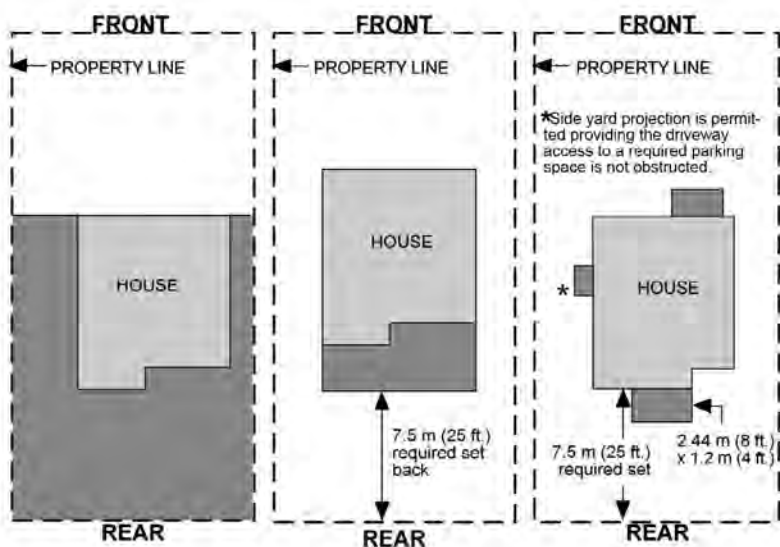
Where and how high can I build my deck?

As indicated in **FIGURE 4**, zoning requirements on the height of the deck will determine its location.

If I cannot meet the zoning requirements, what are my alternatives?

To vary these requirements you must apply for a Zoning variance. This application can be made at Unit 31 - 30 Fort Street, on the main floor. Note: There are fees associated with a zoning variance application.

FIGURE 4 - DECK LOCATION



Deck

600 mm (2 ft.)
in height or under

Deck is not permitted in front yard

Deck

Higher than 600 mm
(2 ft.) in height

Decks higher than 600 mm (2 ft.) above the average level of the adjoining ground must provide the same set backs as the dwelling.

Landing

Between 600 mm/1.2m
(2 ft./4 ft.) in height

Landings higher than 600 mm (2 ft.) above the average level of the adjoining ground but not higher than 1.2 m (4 ft.) may project into the required front, side and rear yard provided that the area is not greater than 3.35 m² (36 ft.²). If the landing exceeds 3.35 m² (36 ft.²), the set backs are the same as the dwelling.

OPEN DECKS UNDER 1300 MM (4 FT. 3 IN.) IN HEIGHT

Surface Pad Foundations

Surface pad foundations are only permitted when an open deck is

- a) not more than one storey;
- b) not more than 55m² (592 ft²) in area;
- c) not more than 1300 mm (4 ft. 3 in.) in distance from finished ground to the underside of the joist;
- d) not supporting a roof, and
- e) not attached to another structure, unless it can be demonstrated that differential movement will not adversely affect the performance of that structure, as determined by the authority having jurisdiction.

When using surface foundations, access must be provided to the foundation to permit re-leveling of the deck platform. It can be provided either by:

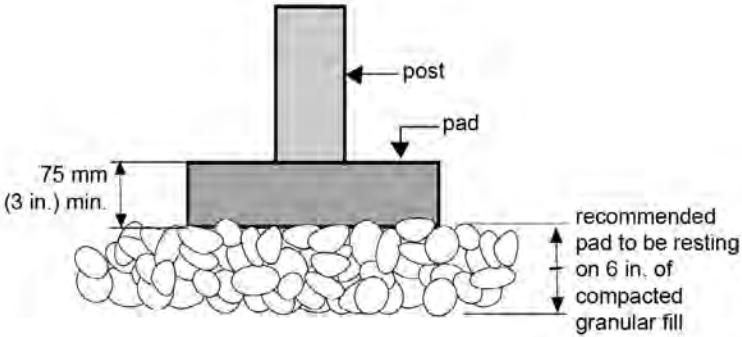
- a) a passageway with a clear height and width under the deck platform of not less than 600 mm (2 ft); or
- b) by installing the decking in a manner that allows easy removal (eg. screws)

What are the recommendations for a surface pad foundation?

Surface pads of concrete shown in **FIGURE 5** should be a minimum of 75 mm (3 in.) thick. Wood posts and/or wood beams closer than 150 mm (6 in.) to the ground must be pressure-treated preservative lumber to prevent the premature deterioration of the post or beam, which will be bearing on the pad.

Refer to **TABLE 1** to determine the recommended size of the surface pad foundation. These pad sizes are based on existing industry standards and are generally available at most lumber or home supply dealers.

FIGURE 5 - SURFACE PAD FOUNDATION

TABLE 1 - RECOMMENDED DECK FOUNDATION PAD SIZES⁽¹⁾

Maximum Supported Joist Length ⁽²⁾	Concrete Surface Pad Size ⁽³⁾ (length x width x thickness)
1.22 m (4 ft.)	300 mm x 300 mm x 100 mm (12 in. x 12 in. x 4 in.)
2.45 m (8 ft.)	450 mm x 450 mm x 75 mm (18 in. x 18 in. x 3 in.)
3.65 m (12 ft.)	600 mm x 600 mm x 150 mm (24 in. x 24 in. x 6 in.)

Notes to TABLE 1:

This table requires beams that are supported every 2.44 m (8 ft.) or less.

Supported joist length means half the span of joists supported by the beam plus the length of the overhang beyond the beam. (See **FIGURE 8**)

Pad sizes are based on industry standards.

Can a pergola or a trellis type structure be added to a deck on pads?

Yes. A pergola or trellis would not support snow or rain loading, and would not be considered a building according to the Manitoba Building Code. These types of structures are designed to provide shade and would not be subject to the more restrictive requirements of the code.

Note: While a permit may not be required for a pergola or trellis, good construction practice is mandated by the City of Winnipeg Building By-Law (4555/87), and the ultimate responsibility of the owner to ensure safety of occupants and property are maintained.

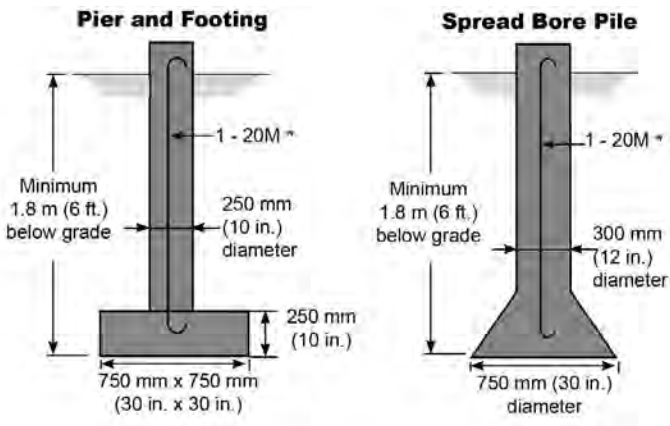
OPEN DECKS OVER 1300 MM (4 ft. 3 in.) IN HEIGHT

Pile or Pier Foundations

When the underside of the deck joists are more than 1300 mm (4 ft. 3 in.) above the ground, the foundation depth must be

at least the depth of frost penetration - 1.8 m (6 ft.). A pier or pile type foundation, as shown in **FIGURE 6**, or alternatively a foundation designed by a Professional Engineer is required. If your long term goal is to enclose all or a portion of your deck, it is suggested that you use a foundation as described in the **House Additions** brochure.

FIGURE 6 - PILES OR PIERS PIER AND FOOTING



What other options are available?

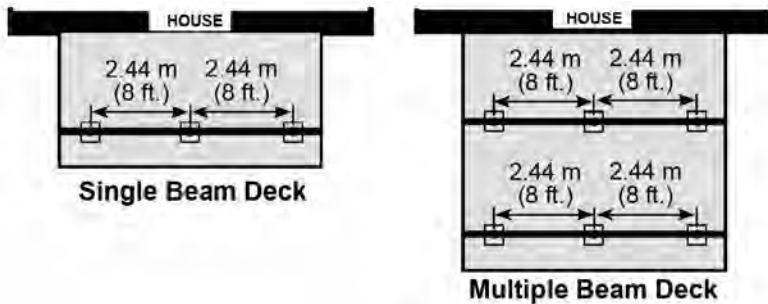
A foundation using “ground anchors” may be permitted providing the anchor extends to below the depth of frost penetration and has been properly tested. You may need to retain someone to do load calculations to determine that the loads transferred to the foundation does not exceed the loads for the tested anchors. If your future plans are to enclose the deck with a sunroom or screened patio the type of “ground anchors” must be approved for such uses complete with plans sealed by a professional engineer.

How far apart can these pads, piles, or piers be installed?

The location of the pads, piles, or piers can vary depending on the size and type of material used for the beam that spans from one pad, pile, or pier to the other; and the amount of floor area that each individual pad, pile, or pier is required to carry.

The examples shown in **FIGURE 7** are based on a beam that is supported a maximum 2.44 m (8 ft.) on centre. The beam table that follows indicates beams which are adequate for this spacing.

FIGURE 7 - DECK BEAM SPACING



Can I vary from this 2.44 m (8 ft.) spacing?

The beam sizes indicated in this publication have been calculated by using common engineering principles. Other variations are possible provided the deck is designed and installed to carry a live load of 1.9 kPa (40 psf).

If you wish to increase the spacing of the pads, piles, or piers or if you wish to reduce the beam sizes indicated in the beam tables, you may have to retain someone who is familiar with engineering calculations. Whichever design you choose, it must be indicated on your plans at the time of your building permit application.

What size posts should I use and how should they be anchored?

Posts, if used, should be at least the width of the beam, centred on the pad, pile, or pier, and securely fastened to the beam by means of toe-nailing, wood gussets, angle brackets, or other equivalent method. Posts exceeding 1.5 m (5 ft.) in height should be braced to each other or up to the beam and floor or, alternatively, they should be anchored to the pad, pile, or pier in order to prevent them from shifting at the bottom.

What size of beams do I need?

The beam table (TABLE 2) is intended for single beam decks and multiple beam decks that is supported at 2.44 m (8 ft.) intervals along the beam. See also **FIGURE 8**.

TABLE 2 - DECK BEAM SIZES(1)

Maximum Supported Joist Length ⁽²⁾	Beam Size ⁽³⁾
1.82 m (6 ft.)	3 - 38 x 140 mm (3 - 2 x 6) or 2 - 38 x 184 mm
2.44 m (8 ft.)	4 - 38 x 140 mm (4 - 2 x 6) or 2 - 38 x 184 mm (2 - 2 x 8)
3.05 m (10 ft.)	3 - 38 x 184 mm (3 - 2 x 8) or 2 - 38 x 235 mm (2 - 2 x 10)

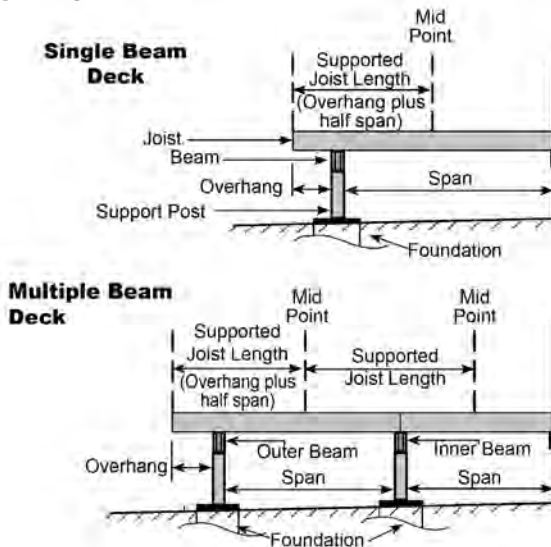
Notes to TABLE 2:

This table requires beams to be supported every 2.44 m (8 ft.) or less.

Supported joist length means half the span of joists supported by the beam plus the length of the overhang beyond the beam. (See **FIGURE 8**.)

This table is for use with Spruce-Pine-Fir lumber grades 1 and 2.

FIGURE 8



How do I calculate the loads on my foundation?

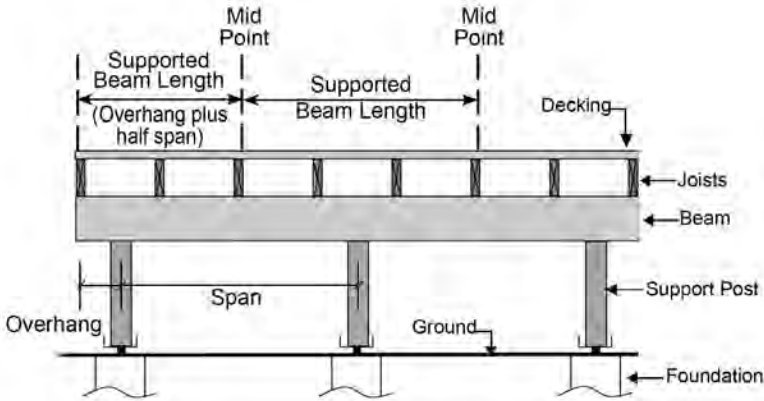
The loads can be calculated using the formula below and **FIGURES 8 and 9**.

Load = (Supported Joist Length) X (Support Beam Length) X 50 lbs. per sq. ft. (total floor load) = total load (in pounds)

Supported Joist Length - see Table 2, Note 2 and **FIGURE 8**

Supported Beam Length means half the span of the beam supported by the column plus the length of the overhang beyond the column. (See **FIGURE 9**)

FIGURE 9



HOUSE

EXAMPLE

A _____

B _____

C _____

Calculations for A and C. (They would have the same reaction.)

$$(10/2 + 2) \times (8/2 + 2) \times 50 \text{ lbs./ft}^2 = \text{Total Load (lbs.)}$$

$$(7 \times 6 \times 50 = 2100 \text{ lbs.})$$

Calculations for B

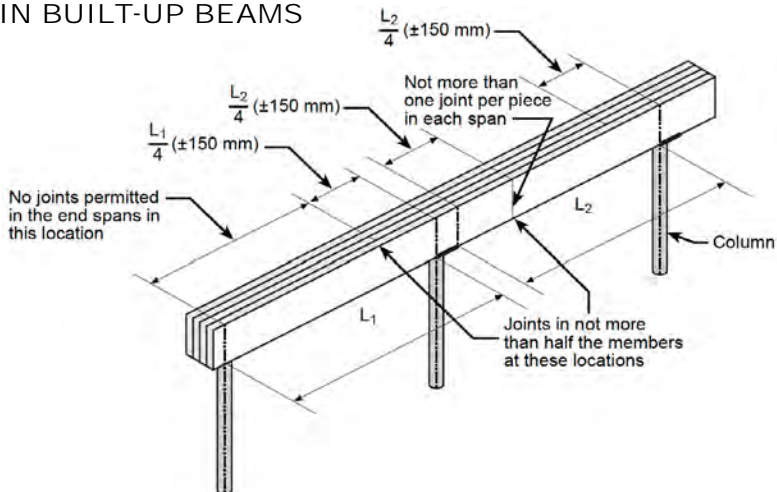
$$(10/2 + 2) \times (8/2 + 8/2) \times 50 \text{ lbs./ft}^2 = \text{Total Load (lbs.)}$$

$$(7 \times 8 \times 50 = 2800 \text{ lbs.})$$

Can I have joints in the beam?

Yes. However, joints are ONLY permitted on multi-span beams. When joints are necessary, they should be situated on a support post or within +/- 150 mm (6") of the quarter points of the clear span of the beam. No joints are permitted in the end spans of the beam and not more than one joint per piece in each span. On multiple-ply laminated beams the joints should be staggered so that they occur on alternate supports. If it is intended to project the beam beyond the end supports, there should be no joints on the end support. See **FIGURE 10**.

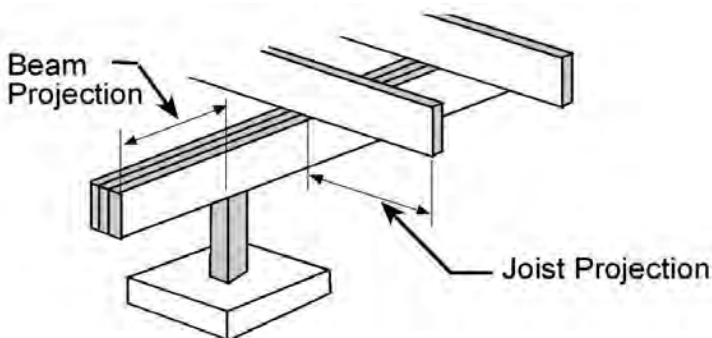
FIGURE 10 - JOINT LOCATION IN BUILT-UP BEAMS



How far can I project the beam beyond the end support?

The beam can project up to a maximum of 600 mm (2 ft.) beyond the end support. See **FIGURE 11**.

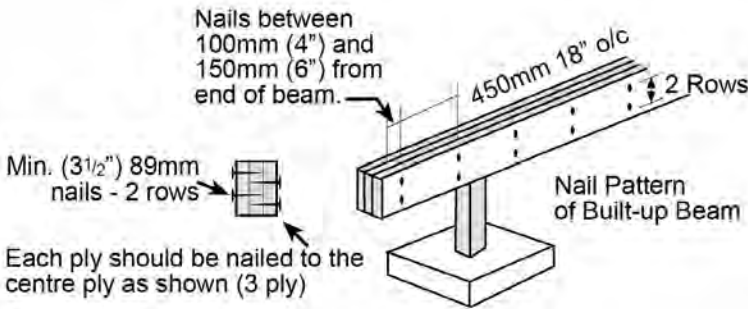
FIGURE 11



How should beam laminations be nailed together?

Individual members must be nailed together. See **FIGURE 12**.

FIGURE 12



How far can the joists project beyond the face of the outside beam?

If you are planning to eventually enclose all or a portion of the deck with a roofed structure which could carry snow, the Building Code states that the joists can only project 400 mm (16 in.) where 2x8 joists are used, and 600 mm (2 ft.) where 2x10 or larger joists are used. The projection of 2x6 joists would require engineering analysis to determine if the floor assembly would be sufficient to carry the superimposed roof loads. See **FIGURE 11**.

Note that even if you are not planning to enclose the deck in the future any projections beyond those indicated above would require engineering analysis.

What size of deck joists do I require?

The size of the joists are governed by the distance they have to span and the spacing at which the joists are installed. TABLE 3 indicates the acceptable span distances for wood decks. Joist spans are measured from face of support to face of support (in the case of a wood deck from face of beam to face of beam, or from face of beam to face of ledger).

Another item you should take into consideration when selecting the size, and spacing of your joists, is the type of material you intend to use as decking. Check with your lumber dealer to ensure that the decking you select will not sag significantly between the joists as a result of the joist spacing you have chosen.

Do the deck members need to be pressure treated?

When the vertical clearances between the wood elements and the finished ground level is less than 150 mm (6 in.) or when the wood elements are not protected from exposure to precipitation they must be pressure treated with a preservative to resist decay.

TABLE 3 - DECK JOIST SPANS - DESIGN LIVE LOADS FOR 1.9 KPA (40PSF)

Commercial Designation	Grade	Joist Size (in)	Maximum Span (ft-in) Joist Spacing			Joist Size (mm)	Maximum Span (m) Joist Spacing		
			12 in	16 in	24 in		300 mm	400 mm	600 mm
			Spruce - Pine - Fir Pressure Treated (Not Incised)	No. 1 and No. 2	2 x 6 2 x 8 2 x 10		10' 1" 13' 2" 16' 10"	9' 2" 12' 1" 14' 1"	7' 10" 10' 2" 12' 6"

What is the difference between guardrails and handrails?

Guardrails are intended to prevent persons from falling off the edge of a stair or a raised floor area such as a deck. The guardrail must be able to withstand the pressure of a human body applied horizontally to it. They must be continuous around the deck surface. Handrails are required to assist persons in ascending or descending stairs. They offer a continuous handhold to support persons who may stumble on the stair.

Will my deck require guardrails?

Guards are only required on decks that are more than 600 mm (2 ft.) above finished ground level.

What if my deck is less than 600 mm (2 ft.) above finished ground level?

A guardrail is not required but, if one is provided, the openings through the guards have restrictions. These openings must either be less than 100 mm (4 in.) or greater than 200 mm (8 in.). This is to prevent children from accidentally getting their head stuck in the guard.

What are the construction requirements for a required guardrail?

Required guardrails shall not be less than 900 mm (3 ft.) high where the walking surface of the deck is not more than 1800 mm (6 ft.) above the finished ground level, and 1070 mm (42 in.) high where the walking surface exceeds 1800 mm (6 ft.). (See **FIGURES 13 & 14**).

Openings in the guardrail must prevent the passage of a spherical object having a diameter of 100 mm (4 in.)

Required guardrails must be a rigid construction, and designed so no member attached or opening will facilitate climbing.

FIGURE 13 - GUARDRAIL HEIGHT

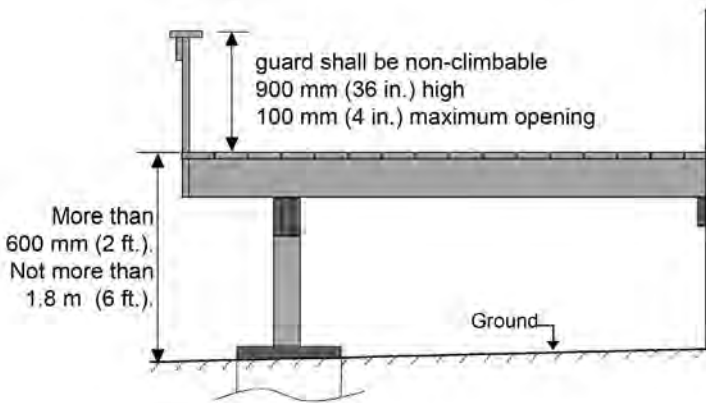
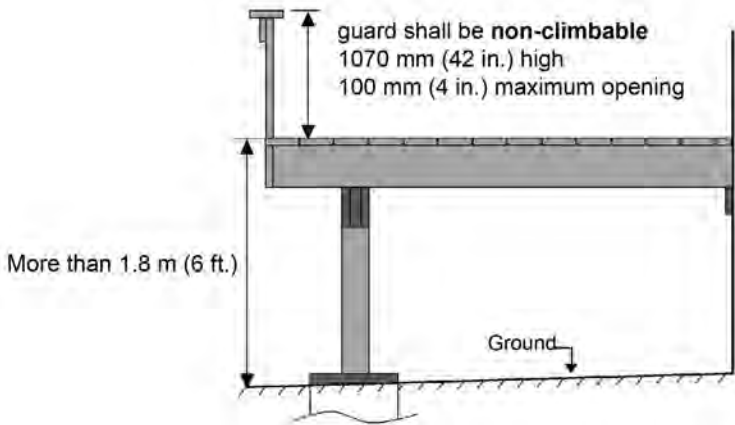


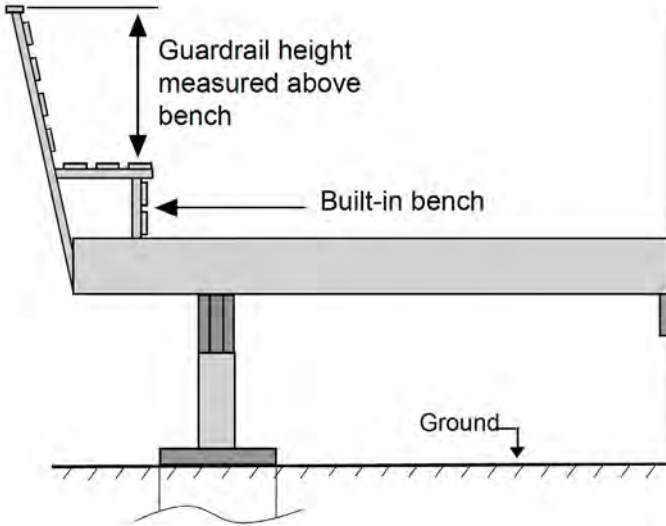
FIGURE 14 - GUARDRAIL HEIGHT



Can a built-in bench serve as a guardrail?

No, unless a guardrail meeting the previously described height and opening requirements is provided above the flat surface of the bench and any openings below the bench also meet the maximum opening requirements. (See **FIGURE 15**)

FIGURE 15 - GUARDRAIL AND BENCH



But what is the difference between a built-in bench and a chair or a table?

If a chair or a table are in a hazardous position you have the option of moving them. A built-in bench does not give you that option.

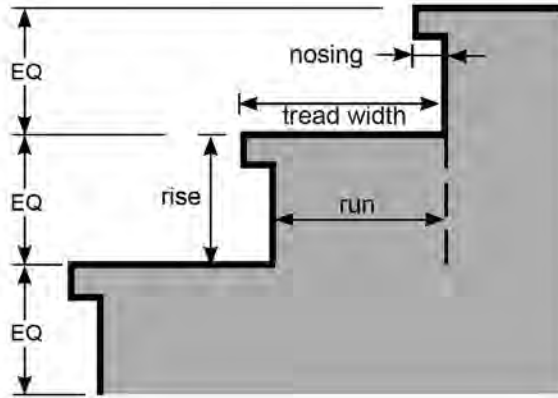
Are there any requirements for stairs?

The Building Code requires stair width to be at least 900 mm (36 in.) and that treads and risers have uniform rise and run in any one flight with riser heights not exceeding 200 mm (8 in.). The Building Code also requires the minimum run of each tread to be 210 mm (8 1/4 in.) and the minimum tread width to be 235 mm (9 1/4 in.). See **FIGURE 16** for details.

Are guardrails required for stairs?

Guards are required on stairs where there is a difference in elevation of more than 600 mm (2 ft) to finished ground level. The height of guards for flights of steps shall be 900 mm (3 ft.) and be measured vertically from the top of the handrail to a line drawn through the leading edge of the treads served by the guard. Guards shall be constructed in the same manner as indicated in sentence b) and c) under construction requirements for guards.

FIGURE 16 - STAIR DETAIL

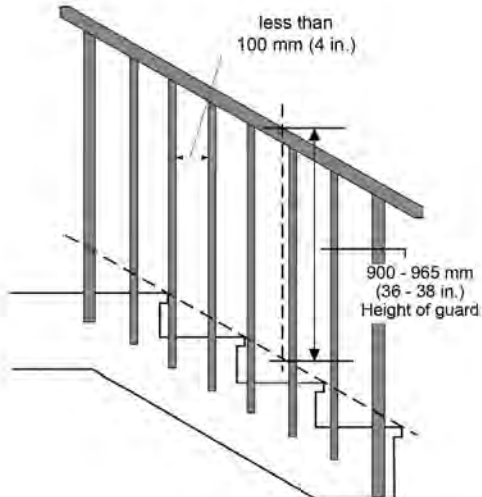


Will the stair also require a handrail?

The Building Code states that if any outside stair has more than three (3) risers, a handrail is required on one side of the stair. The handrail is to be located between 865 mm (34 in.) and 965 mm (38 in.) in height measured vertically from the top of the handrail to a straight line drawn through the tips of the nosings of the stair. Outside stairs with 3 risers or less do not require handrails.

In those cases where a stair also requires a guardrail, a reasonable solution is to provide a guardrail which also acts as a handrail, as shown in **FIGURE 17**.

FIGURE 17 - COMBINED GUARDRAIL\HANDRAIL



Who enforces all of these requirements?

The Housing Inspections Branch of the City of Winnipeg Property and Development Services Department is assigned the responsibility of monitoring construction for compliance with the various Building Codes and By-Laws. This monitoring is carried out by means of the permit approval process and periodic site inspections.

The ultimate responsibility for compliance rests with the owner and/or contractor.

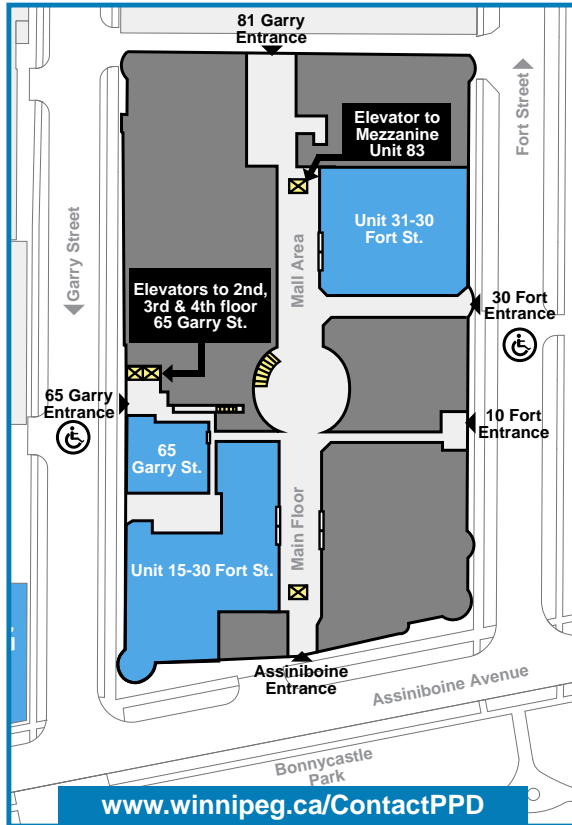
Is there any way that compliance with a certain aspect of the Building Code can be waived?

The Housing Inspections Branch does not have the authority to waive the requirements but it does have the authority to accept alternative solutions which meet the intent of the Building Code. If you feel you can satisfy a Building Code requirement by using an equivalent material or construction method, contact your Building Inspector.

In-Person Customer Service Hours:

Tuesday to Friday 8:30 am to 4:30 pm - All Zoning, Permits and Plan Examination services are available at Unit 31 – 30 Fort Street.

Mondays 8:30 am to 4:30 pm are reserved for telephone inquiries and completed application drop-offs. This enables Zoning and Permits staff to process building and development applications received throughout the week.



Planning, Property & Development Department
83 - 30 Fort Street Winnipeg, Manitoba R3C 4X7

www.winnipeg.ca/ppd

CHECKLIST FOR WOOD DECKS

**** This completed checklist must accompany your permit application ****

Property Address: _____

Foundation type

Less than 4'-3" from grade to underside of joists: Pads Piles Piers Augered piles **

More than 4'-3" from grade to underside of joists: Piles Piers Augered piles **

** Augered pile manufacturer and model number: _____

** If **augered piles** are proposed, plans to be reviewed by Plan Examination Branch

Post locations

See Figure 7 and choose one: 8' on center or less

More than 8' on center - Engineer's review and seal required

Beam sizing

Choose one beam size based on maximum supported joist length described in Figure 8

Beam size	Max. supported joist length
<input type="checkbox"/> 3 ply 2 X 6 or <input type="checkbox"/> 2 ply 2 X 8	6 feet
<input type="checkbox"/> 4 ply 2 X 6 or <input type="checkbox"/> 2 ply 2 X 8	8 feet
<input type="checkbox"/> 3 ply 2 X 8 or <input type="checkbox"/> 2 ply 2 X 10	10 feet

NOTE: All beams must be laminated and resting on top of the posts, as per the details in the brochure. See Figure 12

Beam projection beyond post

See Figure 11 and choose one: Less than 24"

More than 24" - Engineer's review and seal required

Joist sizing

Choose one joist size and its spacing:

	Maximum allowable spans		
	12" o/c	16" o/c	24" o/c
2 X 6	<input type="checkbox"/> 10'-1"	<input type="checkbox"/> 9'-2"	<input type="checkbox"/> 7'-10"
2 X 8	<input type="checkbox"/> 13'-2" **	<input type="checkbox"/> 12'-1" **	<input type="checkbox"/> 10'-2"
2 X 10	<input type="checkbox"/> 16'-10" **	<input type="checkbox"/> 14'-1" **	<input type="checkbox"/> 12'-6" **

NOTES: 1. ** Cross bridging is required where joist length exceeds 12'

2. If joist hangers are used, they shall be secured with nails or lag screws designed specifically for the joist hangers being used

Joist projections beyond beam support

See Figure 11
Choose one based on your joist size above:

2 X 6 joists - Any projection requires Engineer's seal
 2 X 8 joists - 16" projection maximum
 2 X 10 joists - 24" projection maximum

NOTE: All joist projections exceeding the above require Engineer's review and seal

Guardrail height

See Figures 13, 14 and 15 and choose one:

Top of deck less than 24" above grade: - No guardrail required
Top of deck between 2' and 6' above grade: - 36" high guardrail required
Top of deck over 6' above grade: - 42" high guardrail required

NOTES: 1. If constructing a built-in bench, guardrail height is measured from top of the seat to top of the rail

2. Guardrails shall not be climbable and must have balusters/pickets spaced not more than 4" apart



**For more information on the regulations
for wood decks please contact:**

Zoning and Permits Branch
204-986-5140

Plan Examination Branch
204-986-5300

or

311

Planning, Property & Development Department
Unit 31 - 30 Fort Street
Winnipeg, Manitoba
R3C 4X7
www.winnipeg.ca/ppd

August 2019