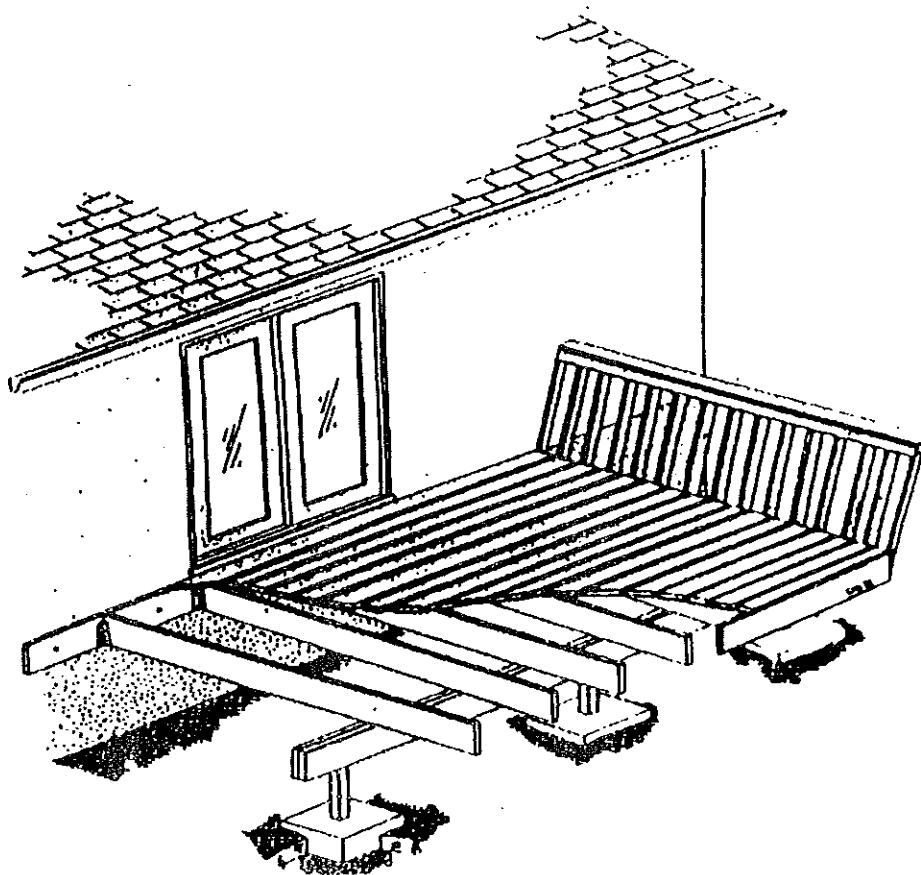




Wood Decks

Construction guidelines for open non-sheltered wood decks for residential dwellings



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Note

The City of Flin Flon 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 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 booklet and the governing City of Flin Flon By-Law, the By-Law will take precedence.

Is a Building Permit required to build a wooden deck or patio deck?

Yes, a building permit is required for all decks more than 20 mm (8 inches) above ground level. A patio deck less than 20 mm (8 inches) above grade is considered a landscape feature and a permit is not required.

Any deck (regardless of height) which will eventually support an enclosed structure with a roof such as a gazebo, sunroom, family room, etc. requires a permit.

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

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

What information is required to make the building permit application?

You must present one copy of a Surveyor's Building Location Certificate. As an alternative, a well-drawn site plan showing all property dimensions, locations of all buildings, and the location and size of the proposed structure may be acceptable.

In addition, a design drawing showing method of construction (including foundation details and how it will be attached to your house), height and materials is required. To assist you in providing this information you can simply fill out the enclosed **Deck Checklist** and present it with your site plan.

Can I assume that the city sidewalk, lane pavement, or neighbour's fence is the property line?

No. City boulevards often exist between your lot and the sidewalk, and pavement may not cover the entire lane. This and the possibility your neighbour's fence is not properly located often leads to errors in where your property begins and ends. The only accurate way to determine your property line is with a Building Location Certificate.

Where do I get a Building Location Certificate?

Check your records. Most homeowners already have this document. It usually comes with the purchase of a house. Otherwise, the services of a qualified Land Surveyor must be obtained.

How close can I build to the property lines?

The required setbacks for a wooden deck vary depending on where it is located, where streets are, and which way it faces. In addition, whether the deck is attached to the house, removed by more than 1.5 m (5 ft.) or more than .3 m (1 ft.) above the ground all must be considered.

The following are some of the yard requirements, which may apply:

Open, unenclosed platforms, decks, patios or landing places, not covered by a roof or canopy, more than 0.3 m (1 ft.) above grade, but not above the building's first floor, may project into any required front yard by 2 m (6.5 ft.) and any required rear or side yard by 4 m (13 ft.), provided the structure does not project within 1 m (3.3 ft.) of any site line.

Open, unenclosed porches, platforms, decks, patios or landing places, not covered by a roof or canopy and not above the building's first floor may project into a court a distance of not more than twenty percent (20%) of the court's width, but in no case more than 4 m (13 ft.).

Open, unenclosed decks, patios, landing places and platforms not covered by a roof or canopy are permitted in any required yard, provided such decks, patios, landing places do not project more than .3 m (1 ft.) above grade.

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

To vary these requirements you must apply for a zoning variance. This application must be made to The City of Flin Flon in writing. Note: There are fees associated with a zoning variance application.

What types of foundations are normally used for wood decks?

In general, the foundation used for a wood deck consists of either:

- (a) surface pads, deck blocks or
- (b) piers/piles or
- (c) ground anchors

What are some advantages and disadvantages of a surface pad foundation?

Advantages: Surface foundations are relatively easy to install, inexpensive, and less disruptive to existing landscape.

Disadvantages: Over time, as a result of shifting soil conditions or settlement, movement will occur, making re-leveling necessary.

OPEN DECKS UNDER 1300 MM (4ft. 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 55 m² (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.

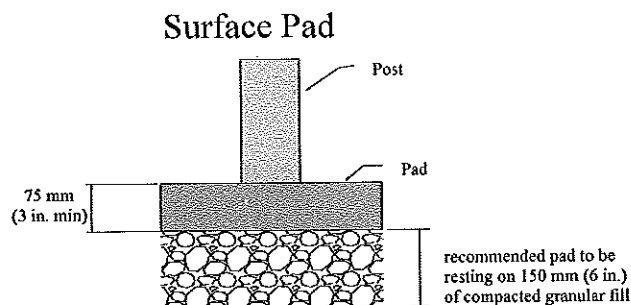
When using surface foundations, access must be provided to the foundation to permit re-leveling of the deck platform. It can be provided either by:

- 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 (ie: screws)

What are the recommendations for a surface pad foundation?

Surface pads should be made of concrete or other material which will not prematurely deteriorate as a result of contact with the soil. As shown in **FIGURE 1**, they should be a minimum 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.

FIGURE 1:



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 improvement dealers.

TABLE 1 – Recommended Deck Foundation Pad Sizes ⁽¹⁾

Maximum Supported Joist Length ⁽²⁾	Concrete Surface Pad Size ⁽³⁾ (length 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:

- 1) This table requires beams that are supported every 2.44 m (8 ft.) or less.
- 2) Supported joist length means half the span of joist supported by the beam plus the length of the overhang beyond the beam (See FIGURE 7)
- 3) Pad sizes are based on industry standards.

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

No. A deck on pads is not permitted to support any additional structures. If your long term goal is to enclose all or part of your deck with a trellis, a screened in area or sunroom, a pile or pier foundation is required.

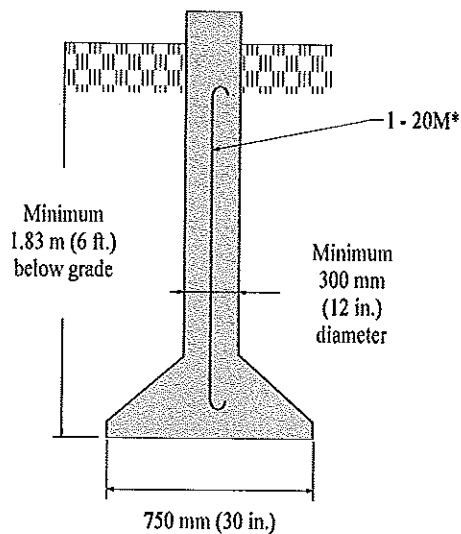
OPEN DECKS OVER 1300 MM (4ft. 3 in.) IN HEIGHT

Pile and Pier Foundations

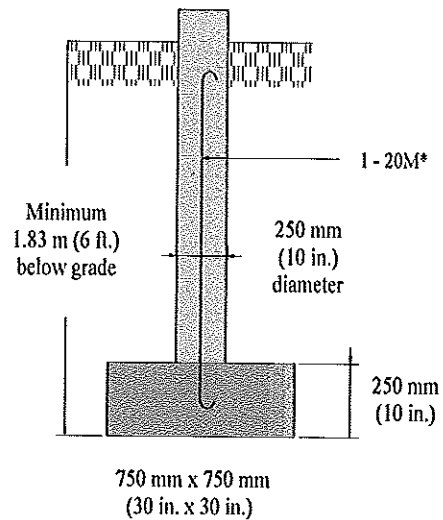
When the underside of the deck joists are more than 300 mm (4 ft. 3 in.) above ground, the foundation depth must be at least the depth of frost penetration – 1.8 m (6 ft.). A pile or pier type foundation as shown in **FIGURE 2**, or alternatively a foundation designed by a Professional Engineer is required.

FIGURE 2:

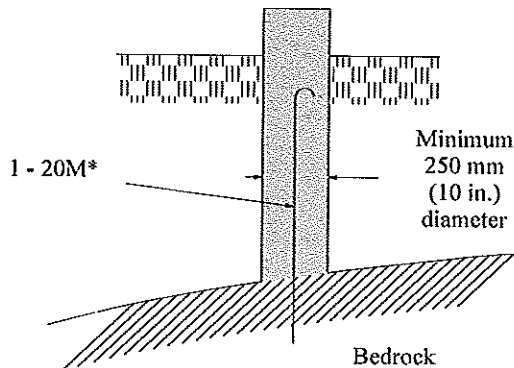
Belled Pile



Pier



Pinned Pile

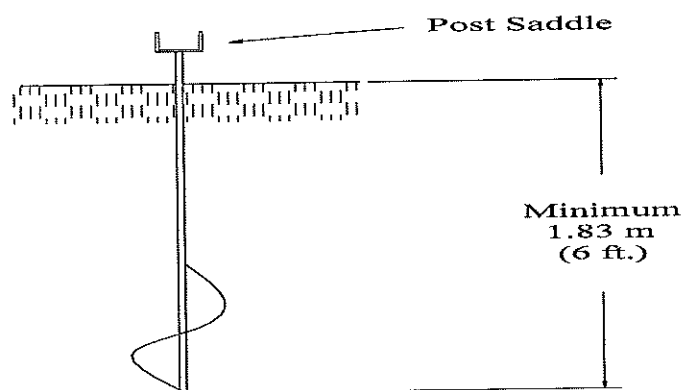


Depth of pile as required.
Re-inforcing bar to be epoxied
into bedrock 8 in. minimum

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 do not exceed the loads for the tested anchors. If your future plans are to enclose the deck with a sunroom, screened patio, etc. the type of "ground anchors" must be approved for sunroom, screened patio, etc. uses.

Ground Anchor

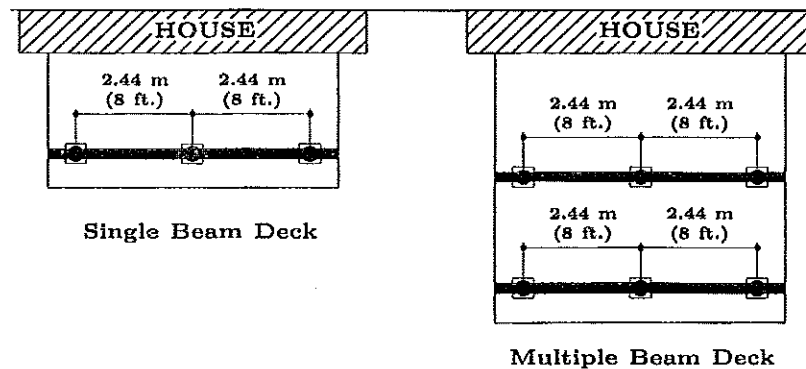


How far apart can these pads, piles, piers or ground anchors be installed?

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 3** are based on the beam supports having a maximum spacing of 2.44 m (8 ft.) on centre. The beam table that follows indicates beams which are adequate for this spacing.

FIGURE 3:



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

Yes, you can place the pads, piles, or piers closer together and still maintain the beam sizes used in this publication for 2.44 m (8 ft.) spacing. Alternatively, if you wish to place them further apart, you would have to install a beam which is adequate for that longer span. The beam sizes indicated in this publication have been calculated 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 the required engineering calculations. Whichever design you choose, it must be indicated on your plans at the time of your building permit application.

Can I use multiples of the 2.44 m (8 ft.) spacing and make my deck deeper and/or wider?

Yes you can, provided you continue to meet all of the same construction requirements and provided you do not exceed the area that is permitted for your particular property.

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

Posts, if used, should be at least the width of the beam, centered on the pad, pile, or pier, and securely fastened to the beam by means of toe-nailing, wood gussets, angle brackets, or other equivalent methods. Where posts exceed 1.22 m (4 ft.) in length, they 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 4**.

TABLE 2 - Deck Beam Sizes ⁽¹⁾

- Design Floor Live Loads for 1.9 kPa (40 psf)

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

Notes to TABLE 2

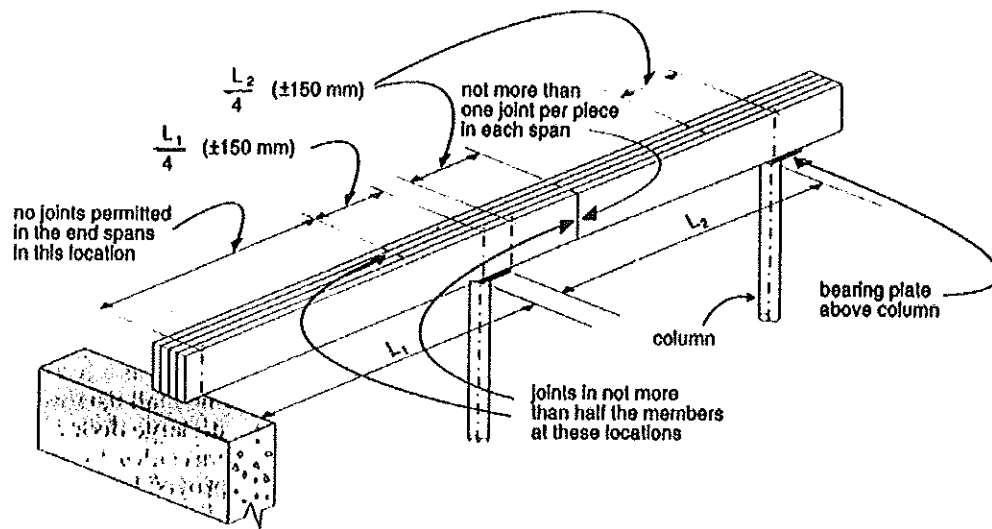
- 1) This table requires beams to be supported every 2.44 m (8ft.) or less.
- 2) Supported joist length means half the span of joists supported by the beam plus the length of the overhang beyond the beam. (See **FIGURE 5**)
- 3) This table is for use with Spruce-Pin-Fir lumber grades 1 and 2.

Can I have joints in the beam?

Yes. However, joints are only permitted on a multi-span beam. When joints are necessary they should be situated on a support (post). On multiple-ply laminated beams the joints should be staggered so that joints 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 4**)

FIGURE 4:

JOINT LOCATIONS IN BUILT-UP BEAMS



How should beam laminations be nailed together?

Individual members must be nailed together with a double row of nails at least 89 mm (3 ½ in.) in length, spaced not more than 450 mm (18 in.) apart in each row. End nails must be located between 100 mm (4 in.) and 150 mm (6 in.) from the end of each piece.

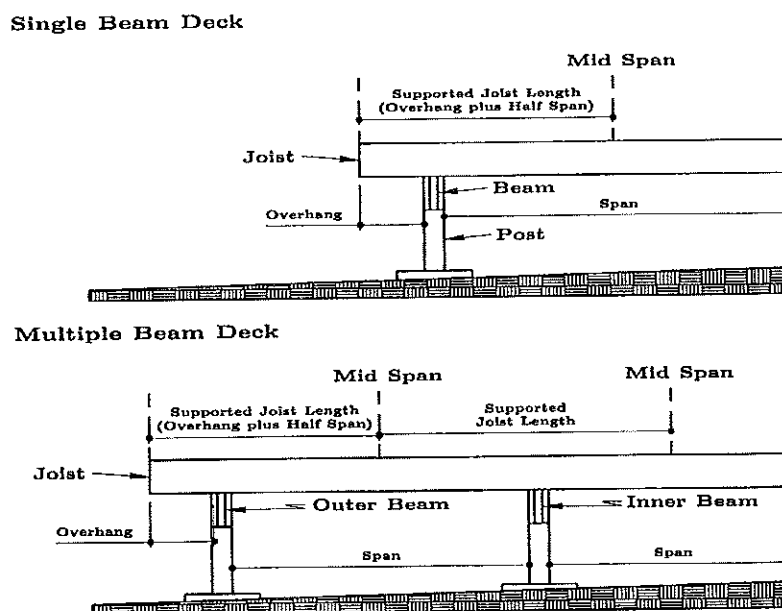
How far can I project the beam beyond the end support?

The beam can project up to a maximum of 600 mm (2 ft.) beyond the end support. See **FIGURE 5**.

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 2 x 8 joists are used, and 600 mm (2 ft.) where 2 x 10 or larger joists are used. The projection of 2 x 4 or 2 x 6 joists would require engineering analysis to determine if the floor assembly would be sufficient to carry the super-imposed roof loads.

FIGURE 5:



What size of deck joists do I require?

The size of the floor joists are governed by the distance they have to span, and the spacing at which the floor joists are installed. **TABLE 3** indicates some common species and sizes of wood and 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 type, size, and spacing of your floor joists is the type of material that 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 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 FLOOR JOIST SPANS⁽¹⁾
Design Floor Live Loads for 1.9 kPa (40 psf)

Commercial Designation	Grade	Joist Size (in.)	Maximum Span (ft.>-in.)			Joist Size (mm)	Joist Spacing (mm)		
			Joist Spacing				300	400	600
			12 in	16 in	24 in				
Spruce-Pine-Fir	No. 1 And No. 2	2 x 4	7' 6"	6' 10"	5' 11"	38 x 89	2.29	2.08	1.82
		2 x 6	11' 10"	10 9"	9' 4"	38 x 140	3.61	3.28	2.86
		2 x 8	15' 7"9	14' 2"	11' 7"	38 x 184	4.74	4.31	3.52
		2 x 10	19' 11"	17' 4"	14' 2."	38 x 235	6.06	5.27	4.30

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 against it.

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?

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

- a) Required guardrails shall not be less than 900 mm (35 in.) 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 **FIGURE 6**)
- b) Openings in guardrails must prevent the passage of a spherical object having a diameter of 100 mm (4 in.).
- c) Required guardrails shall be designed so no member attached or opening shall facilitate climbing.

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

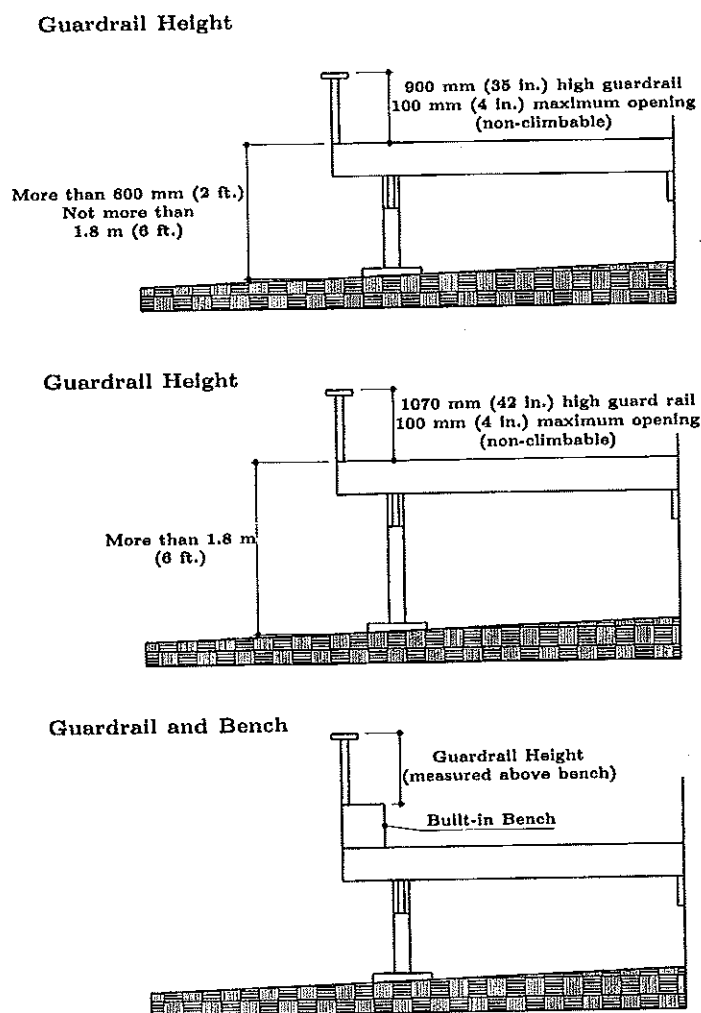
What is the difference between a built-in bench and a chair or a table?

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.

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. Any openings below the bench also meet the maximum opening requirements.

FIGURE 6:

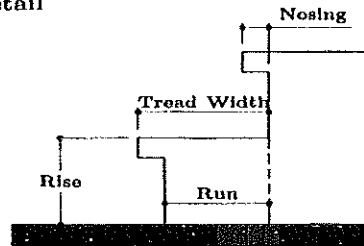


Are there any requirements for stairs?

The Building Code requires stair width to be at least 900 mm (35 in) and that that treads and risers have uniform rise and run. In any one flight with the riser heights not exceeding 200 mm (8 in.). The Building Code also requires the minimum run of each tread to be 210 mm (8 ¼ in.) and the minimum tread width to be 235 mm (9 ¼ in.). See **FIGURE 7**

FIGURE 7:

Stair Detail



Are guardrails required for stairs?

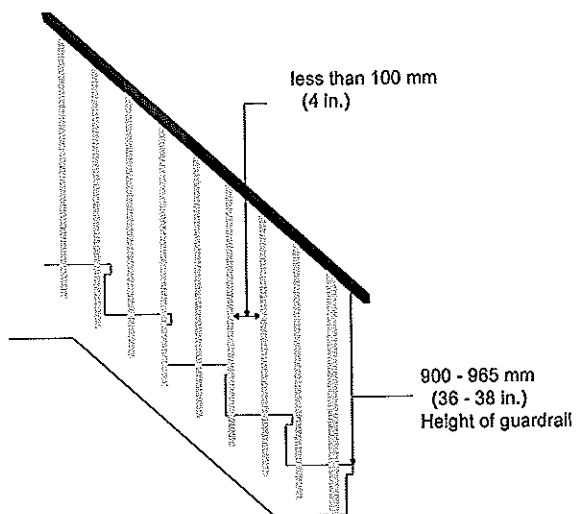
Stairs which have more than three (3) risers and which exceed 600 mm (2 ft.) above the finished ground level also require guardrails. These guards are to be at least 900 mm (36 in.) in height measured vertically from the top of the guard to a line drawn through the leading edge of the treads served by the guard. Construction requirements are the same as noted above in respect to openings and whether or not it is climbable.

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. As shown in **FIGURE 8**, the handrail is required to be a minimum of 865 mm (34 in.) to a maximum of 965 mm (38 in.) in height measured vertically above a line drawn through the outside edges of the stair nosing. Stairs with three (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 900 mm (36 in.), which also acts as a handrail.

Figure 8:

Combination Guardrail/Handrail



Notes

Who enforces all of these requirements?

The Building Inspector of the City of Flin Flon is assigned the responsibility of monitoring construction for compliance with various Building Codes and By-Laws. This monitoring is carried out by means of the permit approval process and periodic site inspections.

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

Building Inspectors do not have the authority to waive the requirements, but they do have the authority to accept equivalencies, which meet the intent of the Building Code. If you feel that you can satisfy a Building Code requirement by using an equivalent material or construction method, contact the Building Inspector at

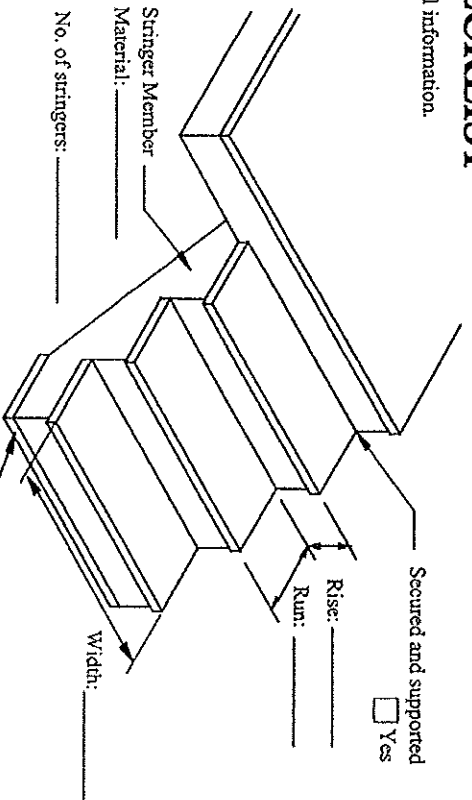
**The City of Flin Flon
20 First Avenue
Flin Flon MB
R8A 0T7
*(204) 681-7520
Fax: (204) 681-7530**

DECK CHECKLIST

Please complete all information.

Sketch house footprint and deck location with distances to Property Lines. Show overall dimensions of the deck.

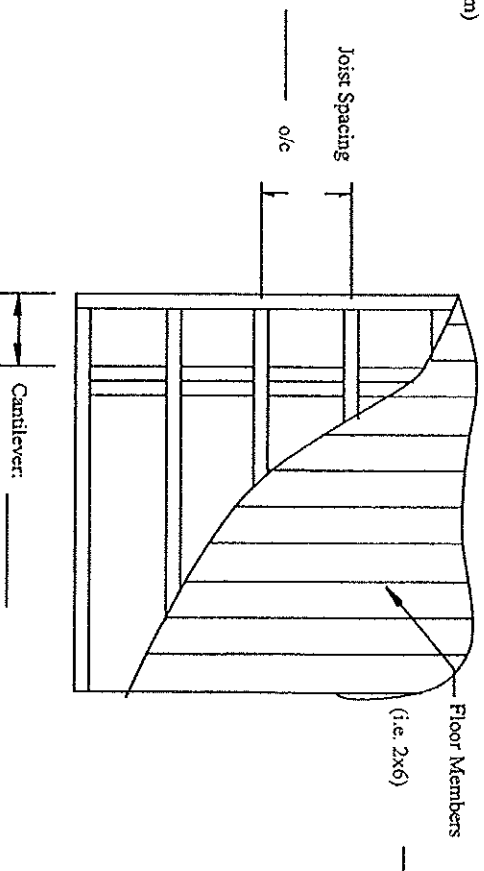
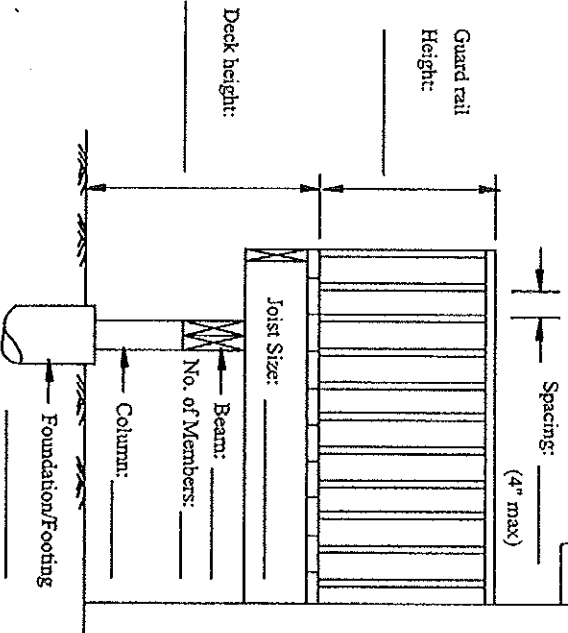
Property Line



NOTE: Handrail required when more than 3 risers.

NOTE: Exterior wood steps shall not be in direct contact with the ground unless suitably treated with a wood preservative.

NOTE: Guard rail required when deck height is > 24" (600 mm) above finished grade.



Owner's Name: _____

Street Address: _____

1000