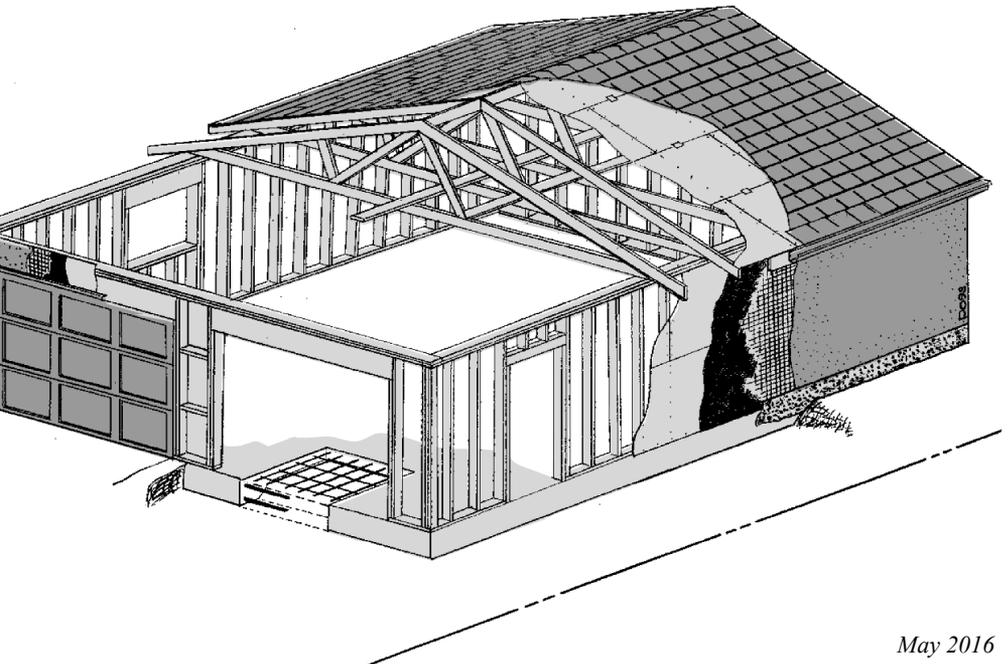


Detached Garages (Wood Frame)

***Construction, zoning, and electrical
requirements for detached garages
and storage sheds that serve a
single family dwelling***



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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.

Detached garages and storage sheds vary in size and area and it is beyond the scope of this booklet to deal with every possible situation. The requirements and construction guidelines that follow are provided to assist you in designing and constructing a detached garage or storage shed which will comply with the regulations. If the nature of your project is different than that contained in this booklet and you are not familiar with the regulations which may be applicable, it is recommended that you contact someone who is knowledgeable in this area.

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

Is a building permit required to build a detached garage or storage shed?

Yes! A building permit is required. This permit may be obtained by submitting the required information to the Planning, Property and Development Department, Unit 31 - 30 Fort Street.

If the proposed detached garage or storage shed is to be built adjacent to a City waterway, then a waterway permit and/or approval for construction in a flood prone area may be required prior to proceeding with construction.

For more information see the pamphlet entitled “Construction Regulations Along City Waterways” or contact the Waterways Section at 986-5098.

***Exception:** Storage sheds that are 10 sq. m. (108 sq. ft.) or less in area do not require a building permit provided they are situated on the property in accordance with the Zoning By-law and provided they do not create a hazard. Larger sheds require a building permit.*

Do I need a building permit for a foundation slab only?

No, but before pouring the concrete slab for your future garage or storage shed you should make sure that this slab will meet ALL applicable Building Code and Zoning By-law regulations with respect to:

- a) allowable size;
- b) appropriate thickness and reinforcing; and
- c) allowable distances from property lines and the dwelling;

For instance, as explained in other sections of this booklet, the Building Code has special requirements concerning the foundation slab thickness if the structure is 50 sq. m. (538 sq.ft.) or larger in area.

As well, the Zoning By-law has minimum side yard regulations which, together with the proposed width of the roof eaves, will affect the location of the garage or storage shed in relation to the property lines. Please refer to the section on Zoning requirements for further information regarding acceptable locations and allowable size for your detached garage or storage shed.

When you decide to proceed with the construction of the garage or storage shed, a building permit will be required at that time.

What information is required to make a building permit application?

You must present 1 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 (including doors & windows) may be acceptable.

Normally, no construction plans are required if you are building a one-storey conventional wood framed detached garage (commonly referred to as a 'garage package') structure. However, in certain instances, additional information including plans or design by a Professional Engineer may be required.

What about a carport? Does it require a building permit?

Yes! A building permit is required to build a carport. If the carport stands alone or is attached to a detached garage, then the Zoning and Building Code regulations in this booklet apply.

Construction plans will be required for all detached carports. Detailed information must be provided on the roof framing, the number of posts, the post foundation and the size of the beams over top of the posts.

If the carport is attached to the house or to an attached garage, then it must comply with the regulations for house additions. The Zoning and Building Code regulations for house additions are different from those contained in this booklet. Please contact the Planning, Property and Development Department for more information.

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

No! The only accurate way to determine your property line is with a Manitoba Land Surveyor's Staking Certificate.

How can I obtain a Staking Certificate?

Check your records. Some homeowners may have previously acquired this document in conjunction with receiving a Manitoba Land Surveyors Building Location Certificate. Otherwise, the services of a qualified Land Surveyor should be obtained. A number of firms are listed in the Yellow Pages. Using the services of a Land Surveyor is the best way to avoid property boundary disputes with neighbours.

How close can I build to the property lines?

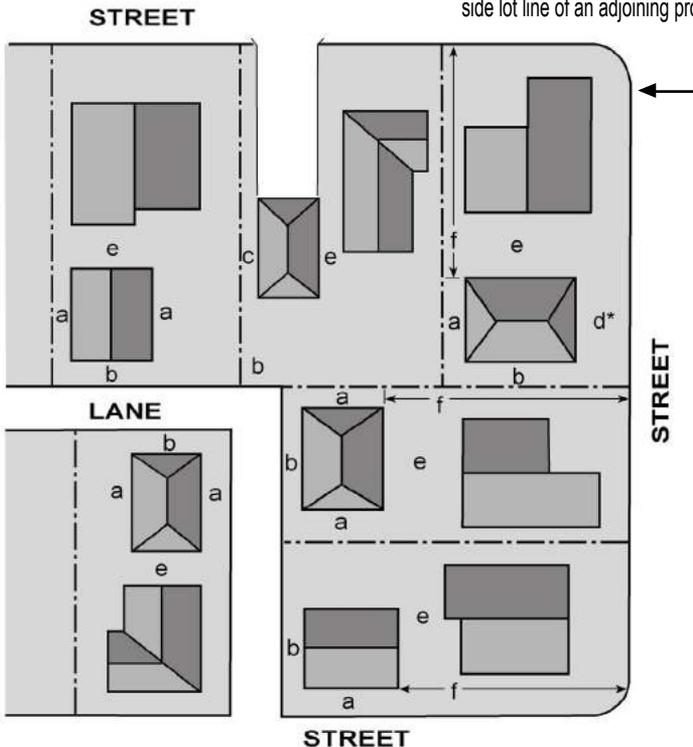
In most cases when a garage or storage shed is built to the rear of the dwelling, it can come as close as 600 mm (2 ft.) to the side and rear property lines.

A garage or storage shed located beside the dwelling or on a reverse corner lot* require different setbacks. See FIGURE 1.

FIGURE 1 - Property Line Setbacks

- a - 600 mm (2 ft.)
- b - 600 mm (2 ft.)
- c - same as dwelling (usually 1.2 m (4 ft.))
- d - same as dwelling (usually 2.7 m (9 ft.))
- e - 1 m (3 ft.) clear of all projections
- f - 18 m (60 ft.) to front property and behind rear wall of dwelling

(* a reverse corner lot is a corner lot where its rear property line abuts the side lot line of an adjoining property.)



Do these setbacks include the overhang?

In the required setbacks from the property lines to the wall of the garage, shed or carport posts, a 300 mm (1 ft.) overhang is permitted. (Eavestrough may be added to the 300 mm (1 ft.) overhang.)

NOTE: It should be recognized that if a larger overhang is desired then the garage or storage shed wall must be set back further from the property line. A clear separation of 300 mm (1 ft.) from the property line to the eaves must always be maintained as shown in FIGURE 2. In this example the 300 mm (1 ft.) overhang requires that the garage wall be set back 600 mm (2 ft.) from the property line.

What is the maximum height allowable?

The maximum height allowable for a garage or storage shed is 4.0 m (13 ft.) determined according to roof style as shown in FIGURE 3.

FIGURE 2 - Setback From Overhang.

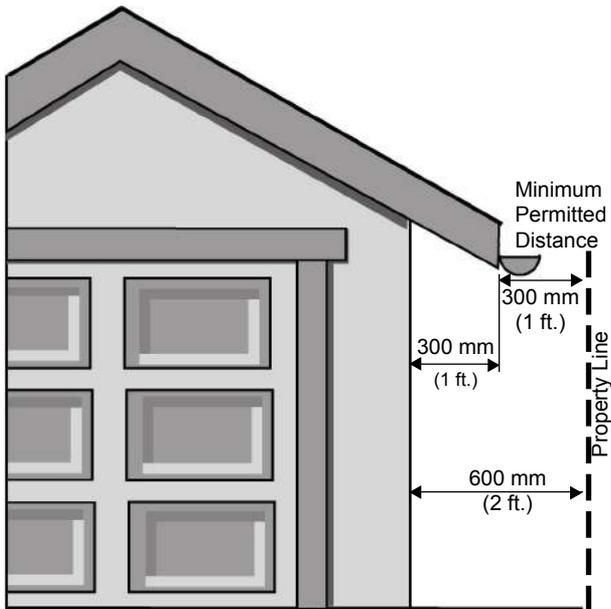
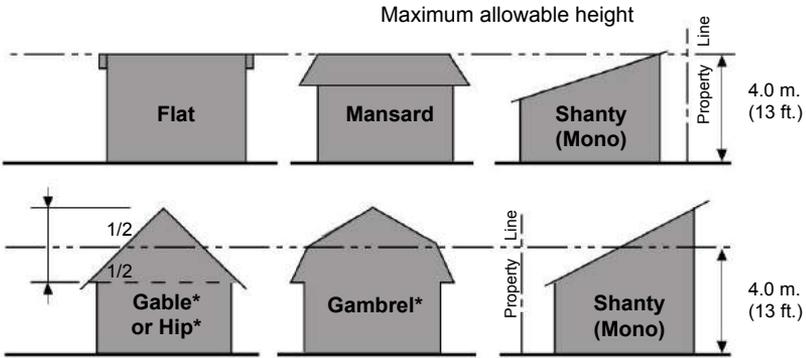


FIGURE 3 - Allowable Roof Heights.



**Note: Where the slope of a gable, gambrel, or hip roof, or any portion of such roof is less than 1:3 (rise:run), the building height shall be measured as though the roof were flat.*

How large of a garage can I build?

The size of a garage, shed or carport cannot exceed 12.5% of the total lot area to a maximum of 81.75 m² (880 sq. ft.). For example, if the lot is 40 x 100 ft. (4000 sq. ft.) then up to 500 sq. ft. (12.5% of 4000) of accessory buildings may be constructed. However, a maximum of 45 m² (484 sq.ft.) of accessory structures is permitted regardless of lot area. For example, if a lot is 25 ft x 100 ft (2500 sq. ft.) the maximum of 484 sq. ft. would be allowable.

If I cannot meet these 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.

What type of foundation is required for a one-storey wood frame detached garage?

1. For a detached garage having a building area of less than 50 sq. m. (538 sq. ft.) it is recommended that a concrete slab with a thickness of not less than 100 mm (4 in.) be used as shown in FIGURE 4a.
2. For a building area of 50 to 70 sq. m. (538 to 753 sq. ft.) inclusive, it is recommended that a thickened edge concrete slab be used as shown in FIGURE 4b.
3. For foundations other than those shown in Figures 4a and 4b, or if the building area is greater than 70 sq. m. (753 sq. ft.), or if the garage supports an upper floor or a roof with other than limited attic storage floor area, the foundation must be designed by a professional engineer registered in the Province of Manitoba.

NOTE: To be considered as one-storey, roof trusses that are designed for storage shall be limited to 1066 mm (42 in.) height, 2590 mm (8 ft 6 in.) length and 1.0 kPa (20 psf) storage live load.

Foundation Plan for a 1-Storey Detached Garages

FIGURE 4a

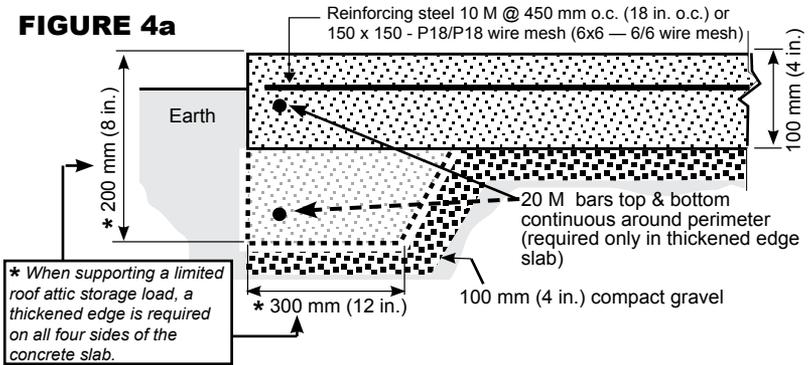
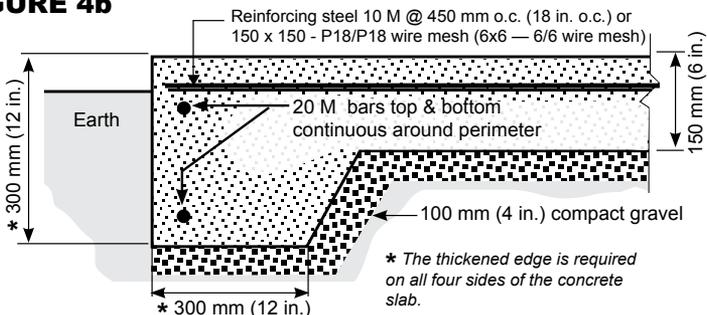


FIGURE 4b



What if I add on to my existing garage?

For a garage, shed or carport addition to an existing structure, the entire foundation, both the existing and the addition, must be made to comply with the foundation requirements shown in FIGURES 4a and 4b or alternatively the foundation must be designed by a professional engineer.

Can I vary from the foundation slab details shown in this pamphlet?

The details and standards in the pamphlet are considered non-engineered details and are based on past “good construction practice”. Variations from these design standards are ONLY permitted where the design is by a professional engineer. Some variations that will require an engineer are:

1. Wood mudsill foundation and anchorage details to prevent uplift due to wind.
2. Foundation slab that includes a curb of more than 150 mm (6 in.) or retaining wall to hold back the earth where the lot is not level.
3. Foundation slab that is greater than 70 sq.m. (753 sq. ft.)
4. Foundation slab that supports a second floor or roof attic storage with a height of more than 1066 (42 in.) and/or supports a load more than 1.0 kPa (20 psf).

What type of concrete do I require for my foundation slab?

Concrete used for all detached garage or shed foundation slabs must have a minimum compressive strength of 32 MPa (4600 psi) after 28 days and must have air entrainment of 5 to 8 per cent.

Do I have to fire-rate the exterior walls?

You must fire-rate only those walls which are closer than 600 mm (24 in.) to any property line which faces an adjoining property. If the wall faces a street or a public lane this requirement does not apply.

(**Note:** It is possible that in some instances the Zoning By-law may not permit a wall to come closer than 600 mm (24 in.) to a property line.)

Fire-rating of walls can be achieved by applying to the inside face of the wall a layer of 15.9 mm (5/8 in.) standard non-rated drywall or 12.7 mm (1/2 in.) fire-rated (Type X) drywall or equivalent.

Can I have windows in the walls?

Windows and other openings, including doors, are only permitted in a wall if the wall is 1.2 m (4 ft.) or more from the property line of an adjoining property. If the wall faces a street or a public lane, this requirement does not apply. There are no distance restrictions between a window in a detached garage and a single family dwelling on the same lot.

The above requirements for fire rating of walls and placement of windows or other openings in these walls are designed to limit fire spread between buildings on adjoining properties.

What type of framing methods are acceptable?

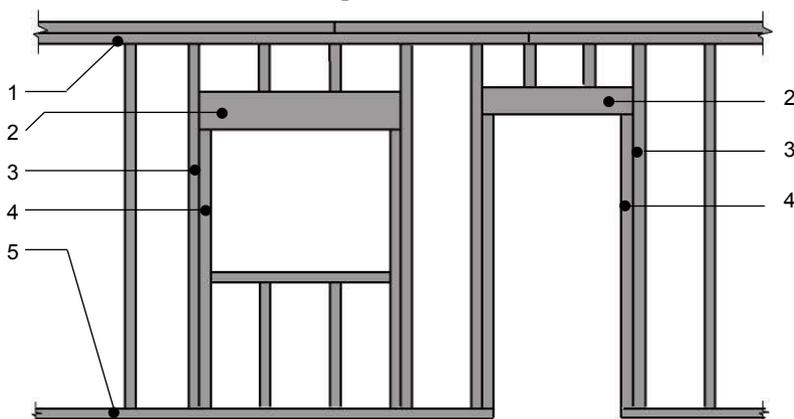
The framing details described in this pamphlet are based on a 1-storey wood-framed structure that do not include any additional superimposed loads and further design consideration may be required to address these additional superimposed loads. Framing methods must be in accordance with good engineering practice. A detailed discussion of this aspect of construction is beyond the scope of this publication. However, some common framing details are indicated on the following pages. Refer to FIGURES 5, 6 & 7, and TABLES 1 & 2.

For more detailed information refer to the book ***Canadian Wood Frame House Construction*** available to purchase from Canada Mortgage and Housing Corporation (CMHC), 600 - 175 Hargrave Street, Winnipeg, MB, R3C 3R8, telephone 204-318-1750. This publication is an excellent guide to good framing methods and construction techniques. It also includes

information for wall and roof sheathing requirements, exterior cladding application, roof coverings, etc.

Where the structure will not be a standard wood frame structure, such as post and beam, concrete block, brick (including brick veneer) or metal framing or where the framing members exceeds that prescribed in this pamphlet, the design must be by a professional engineer and drawings must be submitted under the seal and signature of a professional engineer.

FIGURE 5 - Wall Framing and Lintel Detail.



Notes to FIGURE 5:

- 1) **DOUBLE TOPPLATE:** Joints must be staggered at least one stud spacing. Joints are to be lapped or suitably tied at corners or intersecting walls.
- 2) **LINTEL:** Refer to TABLE 1 to determine the size of lintel required for the opening width you select.
- 3) **THROUGH STUD:**
Refer to TABLE 2 to determine the maximum spacing and maximum unsupported height of studs.
- 4) **CRIPPLE STUD:** The Building Code requires these studs to be a single full length piece of lumber extending from the underside of the lintel to the bottom plate. Two cripples are required on both sides of opening when opening is greater than 3 m (9 ft. 10 in.)
- 5) **SINGLE BOTTOM PLATE:** To prevent uplift, this bottom plate should be firmly anchored down using a minimum 12.7 mm diameter anchor bolts at each side of door openings, at each end of each wall, and at intervals not exceeding 2.4 m (7 ft. 10 in.).

FIGURE 6 - Exterior Corner Detail.

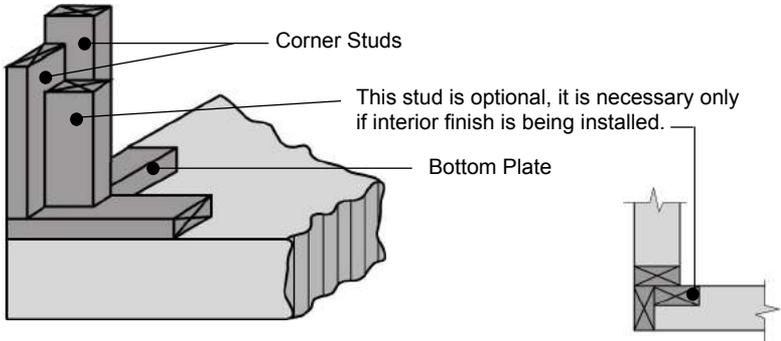


FIGURE 7 - Exterior Wall Framing at Gable End Detail.

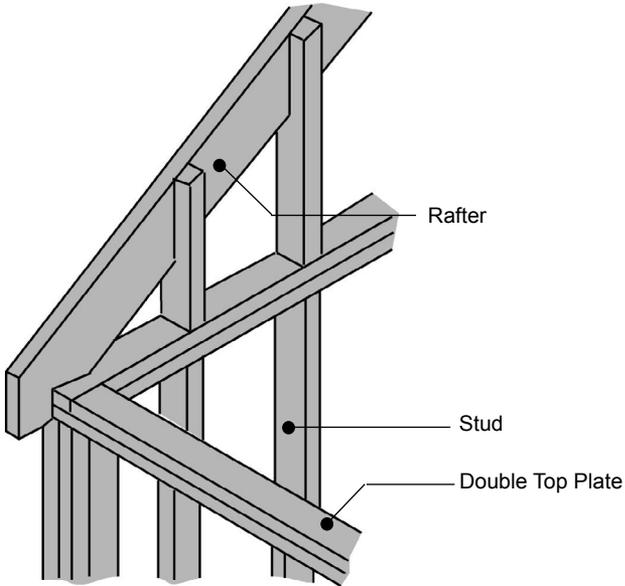


TABLE 1 - Wood Lintel Spans for Windows and Man Doors

Size of Lintels	Maximum Allowable Spans
2 - 38 x 89 mm (2 - 2 x 4)	1.19 m (3 ft. 11 in.)
2 - 38 x 140 mm (2 - 2 x 6)	1.79 m (5 ft. 10 in.)
2 - 38 x 184 mm (2 - 2 x 8)	2.18 m (7 ft. 2 in.)

Notes to TABLE 1:

- 1) *This table is for use with Spruce-Pine-Fir lumber grades 1 & 2.*
- 2) *Built-up lintels must be constructed of full length members. No splicing of members is permitted between supports.*

TABLE 2 - Size and Spacing of Studs

Type of Wall	Supported Loads (including dead loads)	Minimum Stud Size	Maximum Stud Spacing	Maximum Upsupported Height
Exterior	Roof with or without attic storage.	38 x 64 mm (2 x 3)	400 mm (16 in.)	2.4 m (7 ft. 10 in.)
		38 x 89 mm (2 x 4)	600 mm (24 in.)	3.0 m (9 ft. 10 in.)

Note to TABLE 2:

This table is for use with all species of lumber and minimum grades of standard, stud, and No. 2.

What size of lintel is required for the overhead door?

The size of lintel required depends entirely upon the load which it must support which, in this case, is determined by the style of roof. See TABLES 3 & 4.

How are the tables used in determining the required overhead door lintel size?

If the roof style selected is Gable #1 as shown in FIGURE 8, then TABLE 3 is used to determine the lintel size. This table is used where the door opening DOES NOT SUPPORT the roof, i.e. where the roof framing elements such as trusses or rafters run parallel to the door opening.

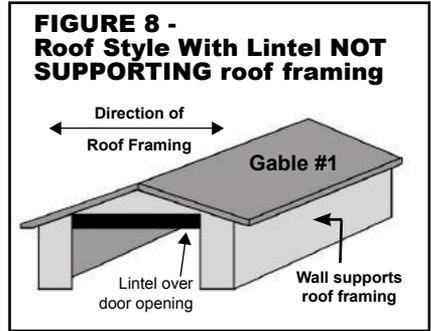


TABLE 3 - Wood Lintels - NOT SUPPORTING Roof Loads

Maximum Door Opening Width	Lintel - Gable Roof Only (Door in Gable End)
2.44 m (8 ft.)	2 - 38 x 184 mm (2 - 2 x 8)
3.66 m (12 ft.)	2 - 38 x 235 mm (2 - 2 x 10)
4.27 m (14 ft.)	3 - 38 x 235 mm (3 - 2 x 10)
4.88 m (16 ft.)	3 - 38 x 235 mm (3 - 2 x 10)
5.49 m (18 ft.)	3 - 38 x 286 mm (3 - 2 x 12)

Notes to TABLE 3:

- 1) This table is for use with Spruce-Pine-Fir lumber grades 1 & 2.
- 2) Built-up lintels must be constructed of full length members. No splicing of members is permitted between supports.

If the roof type selected is as shown in FIGURE 9, i.e. Gable #2, Hip, Mono, or Flat, then TABLE 4 is used to determine the lintel size. This table is used where the lintel over the door opening SUPPORTS the roof, i.e. where the roof framing elements such as trusses or rafters run perpendicular to the door opening.

To select a size of wood lintel simply match the door opening size with the appropriate supported length in TABLE 4 to find the minimum lintel size.

FIGURE 9 - Roof Styles With Lintel SUPPORTING Roof framing.

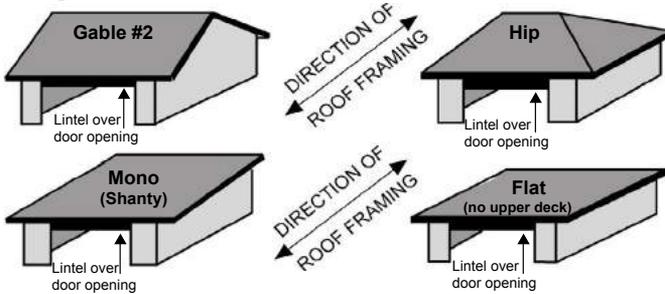


TABLE 4 - Wood Lintels - SUPPORTING Roof Loads

Width of opening (Lintel Span)	SUPPORTED LENGTH (see note 3 below)				
	2.44 m (8 ft.)	3.05 m (10 ft.)	3.66 m (12 ft.)	4.27 m (14 ft.)	4.88 m (16 ft.)
2.44 m (8 ft.)	3 - 38 x 184 (3 - 2 x 8)	3 - 38 x 184 mm (3 - 2 x 8)	3 - 38 x 184 mm (3 - 2 x 8)	3 - 38 x 184 mm (3 - 2 x 8)	3 - 38 x 235 mm (3 - 2 x 10)
2.74 m (9 ft.)	3 - 38 x 184 mm (3 - 2 x 8)	3 - 38 x 184 mm (3 - 2 x 8)	3 - 38 x 184 mm (3 - 2 x 8)	3 - 38 x 235 mm (3 - 2 x 10)	3 - 38 x 235 mm (3 - 2 x 10)
3.05 m (10 ft.)	3 - 38 x 184 mm (3 - 2 x 8)	3 - 38 x 235 mm (3 - 2 x 10)	3 - 38 x 235 mm (3 - 2 x 10)	3 - 38 x 235 mm (3 - 2 x 10)	3 - 38 x 286 mm (3 - 2 x 12)
3.66 m (12 ft.)	3 - 38 x 235 mm (3 - 2 x 10)	3 - 38 x 235 mm (3 - 2 x 10)	3 - 38 x 286 mm (3 - 2 x 12)	4 - 38 x 286 mm (4 - 2 x 12)	4 - 38 x 286 mm (4 - 2 x 12)
4.27 m (14 ft.)	3 - 38 x 286 mm (3 - 2 x 12)	3 - 38 x 286 mm (3 - 2 x 12)	4 - 38 x 286 mm (4 - 2 x 12)	Design Req'd by Engineer	Design Req'd by Engineer
4.88 m (16 ft.)	3 - 38 x 286 mm (3 - 2 x 12)	4 - 38 x 286 mm (4 - 2 x 12)	Design Req'd by Engineer	Design Req'd by Engineer	Design Req'd by Engineer
COLUMN 1	2	3	4	5	6

Notes to TABLE 4:

- 1) The lintels in this table are Spruce-Pine-Fir lumber grades 1 & 2, except those marked * which are Douglas Fir lumber grades 1 & 2.
- 2) Built-up lintels must be constructed of full length members. No splicing of members is permitted between supports.
- 3) Supported length means half the span of trusses, roof joists, or rafters supported by the lintel plus the length of the overhang beyond the lintel (see FIGURE 10).
- 4) If the supported length is between the sizes shown, use the column with the greater depth. For garages or storage sheds with a door width or supported length greater than shown on the tables, consult a Professional Engineer.
- 5) The spans shown in the table are the clear spans between the load bearing supports at each end of the lintel. To find the total length of lintel needed, add the two bearing lengths of the support to the clear span.
- 6) The minimum bearing length of the support at each end of the lintel must be 89 mm (3 1/2 in.).
- 7) Lintel sizes smaller than those shown on these tables may be used provided the lintel has been designed by a Professional Engineer and the lintel design and calculations are submitted and accepted.
- 8) The above noted lintels are not designed to carry masonry or floors above the overhead door. For these types of applications consult a Professional Engineer.
- 9) The deflection limit for lintels was set at a maximum 15 mm (0.6 in.) to ensure proper closure of garage doors.

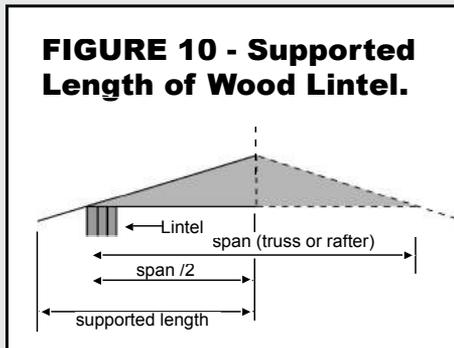
• For Wood Lintel Substitutions please see TABLE 8 on Page 29.

LINTEL SIZE SELECTION FOR AN OVERHEAD DOOR

Example: In order to select the correct size of lintel in cases where it is supporting the roof, three pieces of information are needed: the size of the garage, the width of the overhead door opening, and the size of the roof overhang. As an example, assume a 7.32 m x 7.32 m (24 ft x 24 ft) garage with a 2.74 m (9 ft.) overhead door opening and a 600 mm (2 ft.) overhang. Refer to TABLE 4.

Begin by selecting the row for a 2.74 m (9 ft.) overhead door opening. Next, knowing that the supported length will be half the distance of the roof span plus the overhang (see FIGURE 10), we divide the 7.32 m (24 ft.) roof span distance by 2 and add the 600 mm (2 ft.) roof overhang to get the total supported length of 4.27 m (14 ft.).

Now looking along the table to column 5 where the supported length is 4.27 m (14 ft.), we see that the proper size of lintel would be 3 - 38 x 235 mm (3 - 2 x 10). If there was no roof overhang over the door opening we would look to column 4 where the supported length is 3.66 m (12 ft.). The correct lintel size, in this case, would be 3 - 38 x 184 mm (3 - 2 x 8).



What roof framing choices are there?

In wood framing, there are basically three methods for framing roofs. They are:

1) Framing the roof with pre-manufactured trusses.

There are several truss manufacturers and suppliers listed in the Yellow Pages under both LUMBER-RETAIL and TRUSSES. These firms can provide detailed information regarding the proper installation of their products.

Note: When using trusses or rafters at 600 mm (24 in.) spacings with panel-type roof sheathing of less than 12.7 mm (1/2 in.) thickness, support must be provided to all edges of each roof sheathing panel including those that meet at the ridge. This can be accomplished with the use of 'H' clips as shown in FIGURE 11 and/or solid blocking.

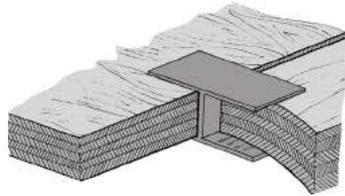


FIGURE 11 - 'H' Clip Detail

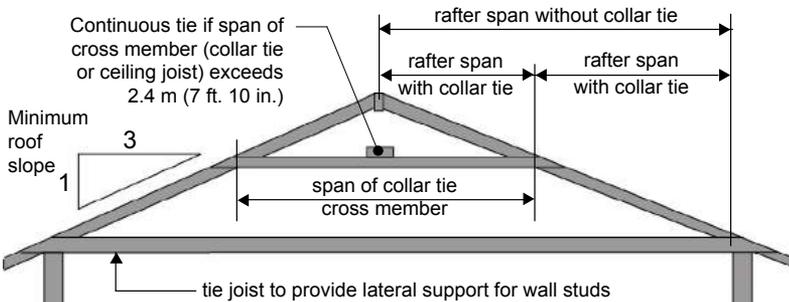
2) Framing the roof with individual pieces of lumber (2x4s, 2x6s etc.).

This is commonly known as stick framing. FIGURE 12 shows a typical cross section of a gable roof and TABLE 5 indicates maximum rafter spans for various species and sizes of rafters. Note that FIGURE 12 makes use of collar ties as a means of reducing a full rafter span into two smaller spans. Collar ties can only be used in this fashion when the roof slope is 1 in 3 or greater.

If you are framing a roof containing hip or valley rafters, the hip and/or valley rafters must be not less than 50 mm (2 in.) greater in depth than the common rafters and not less than 38 mm (1 1/2 in.) in thickness.

Refer to the previously mentioned book available from Canada Mortgage and Housing Corporation (CMHC) for further information on roof framing.

FIGURE 12 - Roof Rafter and Collar Ties for Gable Roof.



**TABLE 5 - Roof Rafter Spans -
Rafter NOT SUPPORTING Ceiling**

Commercial Designation	Grade	Member Size (in.)	Rafter Spacing			Member Size (mm)	Rafter Spacing		
			12 in.	16 in.	24 in.		300 mm	400 mm	600 mm
			ft.- in.	ft.- in.	ft.- in.		m	m	m
Douglas Fir - Larch	No. 1 and No. 2	2x4	9-4	8-6	7-5	38x89	2.86	2.59	2.27
		2x6	14-9	13-5	10-11	38x140	4.49	4.08	3.34
		2x8	18-10	16-4	13-4	38x184	5.74	4.97	4.06
		2x10	23-0	19-11	16-3	38x235	7.02	6.08	4.96
		2x12	26-9	23-2	18-11	38x286	8.14	7.05	5.76
Spruce - Pine - Fir	No. 1 and No. 2	2x4	8-11	8-1	7-1	38x89	2.72	2.47	2.16
		2x6	14-0	12-9	11-2	38x140	4.28	3.89	3.40
		2x8	18-5	16-9	14-6	38x184	5.62	5.11	4.41
		2x10	23-7	21-5	17-8	38x235	7.18	6.52	5.39
		2x12	28-8	25-2	20-6	38x286	8.74	7.66	6.25

COLUMN 1 2 3 4 5 6 7 8 9 10

Note to TABLE 5:

This table applies to roofs with a slope of 1 in 3 or greater. Roof slopes of less than 1 in 3 are subject to different loading conditions, e.g. adequate ridge support must be provided.

ROOF RAFTER SIZE SELECTION

Example: In order to select the correct rafter size for a 6.72 m x 6.72 m (22 ft x 22 ft) detached garage or storage shed with a gable roof having a slope of 1 in 3 or greater, and with spruce rafters (without collar ties) spaced 600 mm (24 in.) apart, we will proceed as follows.

First, we must know the horizontal distance from the wall to the peak of the roof. In this example the distance is 6.72 m (22 ft) divided by 2 or 3.36 m (11 ft), and is called the rafter span.

Next, keeping in mind that 3.36 m (11 ft.) is the required rafter span distance, we look to TABLE 5 in the Spruce - Pine - Fir section for a 600 mm (24 in.) rafter spacing. We are looking here for a span distance that equals or exceeds 3.36 m (11 ft.). We find in the table a span that meets our requirements and it has a figure of 3.89 m (12 ft. 9 in.). We now look across to find the member size that is necessary to obtain this span. It is a 38 x 184 mm (2 x 8 in.) rafter. This rafter size is the minimum size of rafter required for the span of 3.36 m (11 ft.) for this particular gable style roof.

If collar ties are permitted and are used, the required span would be less than 3.36 m (11 ft.) and a smaller member size could be looked up in the table.

3) ***Framing the roof with “home made” trusses.***

This is not recommended for complicated roofs having complex angles or roofs having hips and/or valley rafters. For simple gable roofs, wood trusses must be constructed in accordance with an accepted truss design.

Truss designs vary depending upon spans, roof slope, etc. Before manufacturing your own trusses, obtain an accepted truss design drawing showing the span, the size of the members, the size and thickness of the plywood gussets, and the nailing patterns. Do not copy truss designs used on other buildings. These designs may be inadequate for your application. Alternatively, the truss must be designed by a Professional Engineer registered in the Province of Manitoba.

Note: The use of gang nailers (metal plates) in manufacturing “home made” trusses is not permitted unless extensive engineering involvement and testing is carried out and the supporting documentation is submitted and found acceptable. These types of fasteners are only intended for use under the design and quality control of a truss manufacturer.

Are there any other Building Code requirements?

Yes, there are various other requirements concerning framing, sheathing materials, sheathing paper, flashing, siding, shingling, and stucco application, etc. Most of these aspects of construction are dealt with in the previously mentioned book available from Canada Mortgage and Housing Corporation (CMHC) or the current edition of the Manitoba Building Code.

NOTE:

The information provided in this section is not intended to cover all of the electrical regulations for wiring. Complete electrical requirements are covered in the City of Winnipeg Electrical By-law.

When is an electrical permit required?

An electrical permit must be obtained from the City of Winnipeg Planning, Property and Development Department, Unit 31 - 30 Fort Street, prior to the construction, alteration, repair, or extension of any electrical installation.

Who may obtain an electrical permit for wiring a detached residential garage or storage shed?

An electrical permit can be issued only to:

- a) a person who holds an Electrical Contractor's License from the City of Winnipeg authorizing that person to carry out business or trade in the City of Winnipeg; **OR**
- b) the owner of the detached single family dwelling who is also the **occupant**. The permit would be issued to the owner provided the Manager of Development and Inspections is confident the work will be performed competently.

What information is required to make the application for an electrical permit?

To obtain an electrical permit, the applicant must present a wiring diagram for the proposed installation indicating the location of receptacles, lights, switches, and all other electrical equipment to be installed.

Specific information must be provided for the underground portion of any wiring installation with respect to the type and size of all conductors, cables, and conduits used, along with the depth of the installation and type of any mechanical protection provided.

If a panelboard is to be installed then the diagram must show the method of grounding used and the size of the overcurrent device protecting the panelboard.

Where larger electrical loads are intended to be supplied from this panelboard, such as compressors, arc welders, electric heaters, etc., then the wiring diagram should indicate the overcurrent protection, wire size, and rating in watts for each piece of equipment.

How long will this permit remain valid?

The permit will expire if active work is not commenced within six (6) months of the date of issuance. In addition, the Manager of Development and Inspections may cancel any electrical permit if, in the Manager’s opinion, the privileges granted by that permit are being misused.

Who is ultimately responsible for any electrical installation performed under this permit?

The permit applicant assumes full responsibility for electrical work indicated on the permit and must ensure that the work is carried out to conform with all requirements of the Electrical By-law.

Are there required minimum installation depths for underground conductors?

Yes! There are required minimum installation depths for underground wiring and they are listed in TABLE 6. A typical underground wiring plan is shown in FIGURE 13.

TABLE 6 - Minimum Installation Depth for Underground Conductors

WIRING METHOD	MINIMUM DEPTH NON-VEHICULAR AREAS		MINIMUM DEPTH VEHICULAR AREAS	
	No Mechanical Protection	With Mechanical Protection ⁽¹⁾	No Mechanical Protection	With Mechanical Protection ⁽¹⁾
Conductors or cable NOT having a metal sheath or armour. e.g. NMWU	600 mm (24 in.)	450 mm (18 in.)	900 mm (36 in.)	750 mm (30 in.)
Conductor or cables having a metal sheath or armour. e.g. TECK 90	450 mm (18 in.)	300 mm (12 in.)	600 mm (24 in.)	450 mm (18 in.)
Raceway ⁽²⁾ e.g. Rigid metal conduit or Rigid PVC conduit	450 mm (18 in.)	300 mm (12 in.) ⁽³⁾	600 mm (24 in.)	450 mm (18 in.) ⁽³⁾

Notes to TABLE 6:

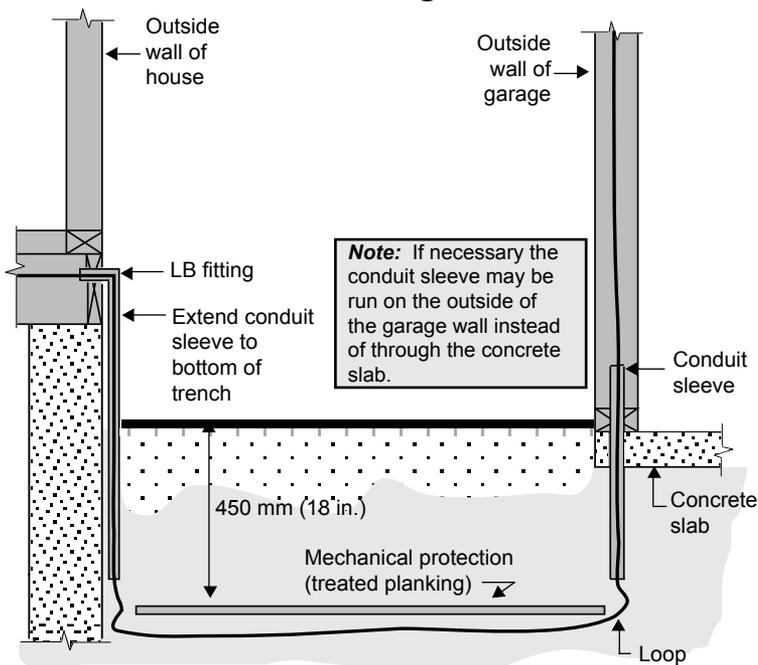
- 1) Mechanical protection must consist of one of the following:
 - a) planking e.g. 2 x 4s or 2 x 6s with a wood preservative other than creosote; or
 - b) polyethylene pipe.
- 2) Conductors or cables installed in underground conduits must be approved for wet locations, e.g. TW, RW, NMW, OR NMWU.
- 3) Raceways installed at a depth of 300 mm (12 in.) in non-vehicular areas and at 450 mm (18 in.) in vehicular areas must have mechanical protection such as treated planking described in note 1 above.

Can the trench for my direct buried power conductors be used for any other purpose?

Yes! However, a minimum horizontal separation of not less than 300 mm (1 ft.) must be provided;

- a) between the direct buried power conductors and any gas line, water line or sewer line, and
- b) between the direct buried power conductors and any Cable TV or communication cable not having a metal sheath.

FIGURE 13 - Wiring Plan for Underground Cable to Detached Garage or Shed.



Note to FIGURE 13:

This is a diagram of an acceptable installation of NMWU underground cable between the house and a detached garage or shed. Note that the cable, when installed at a depth of 450 mm (18 in.), must be protected in the ground by planking at least 50 mm (2 in.) nominal thickness which is treated with a wood preservative other than creosote. As an alternative, the conductor may be protected by running it in a length of polyethylene water pipe from the house to the garage. Where the conductors emerge from the trench, they must be protected against mechanical damage by a piece of rigid metal conduit or rigid PVC conduit. The cable loops at each end of the trench are to prevent damage from ground movement. These loops should be installed whenever a cable emerges from a conduit into direct contact with the earth.

Are overhead power supply conductors a cause for concern?

YES! If you plan to build a garage, carport or storage shed beneath overhead power supply conductors, you must first contact Manitoba Hydro to ensure that proper clearance can be maintained between the building roof and the overhead conductors. Contact your local Manitoba Hydro District Operating Centre at the phone number listed on your Manitoba Hydro bill. The service conductors must have a clearance over the garage roof of 1 m.

Is it a requirement to install a panelboard in the garage?

No, a panelboard is not necessary. However, if one is to be installed, the ampacities (current rating) of the larger conductor sizes that may be required to supply this panelboard are listed in TABLE 7. When a panel is installed, it must be surface mounted with 6 mil poly behind a 20 mm backboard.

What are the minimum circuit and receptacle requirements for detached garages and carports?

- a) All receptacles located outdoors and within 2.5 m of ground or grade level must be protected by a ground fault circuit interrupter (GFCI) of the Class A type.
- b) At least one receptacle, supplied by a separate branch circuit, must be provided outdoors for the use of electrical appliances.
- c) At least one receptacle, supplied by a separate branch circuit, shall be provided for each driveway.
- d) At least one receptacle, supplied by a separate branch circuit, must be provided for each car space in a garage or carport. Garage/carport light fixtures and a garage door opener may also be connected to this circuit.
- e) ARC fault protection is not required for detached garage and sheds
- f) All receptacles located within 2 m of grade must be tamper resistant.
- g) A receptacle must be installed for garage overhead door openers even if no opener is installed.

TABLE 7 - Typical Copper Conductor Ampacities & Over-Current Protection

NMWU Conductor Type FOR DIRECT EARTH BURIAL			NMD-90 Conductor Type FOR INDOOR USE ONLY		
Wire Size	Ampacity (60°C)	Circuit Breaker or Fuse	Wire Size	Ampacity (90°C)	Circuit Breaker or Fuse
#14 AWG	15 Amp	15 Amp	#14 AWG	15 Amp	15 Amp
#12 AWG	20 Amp	20 Amp	#12 AWG	20 Amp	20 Amp
#10 AWG	30 Amp	30 Amp	#10 AWG	30 Amp	30 Amp
# 8 AWG	40 Amp	40 Amp	# 8 AWG	55 Amp	40 Amp
# 6 AWG	55 Amp	60 Amp	# 6 AWG	75 Amp	70 Amp
# 2 AWG	100 Amp	100 Amp	# 3 AWG	115 Amp	100 Amp

Note to TABLE 7: The ampacities shown in the table above are based on NMWU and NMD-90 conductor types. For ampacities of other types of conductors, reference should be made to the City of Winnipeg Electrical By-law.

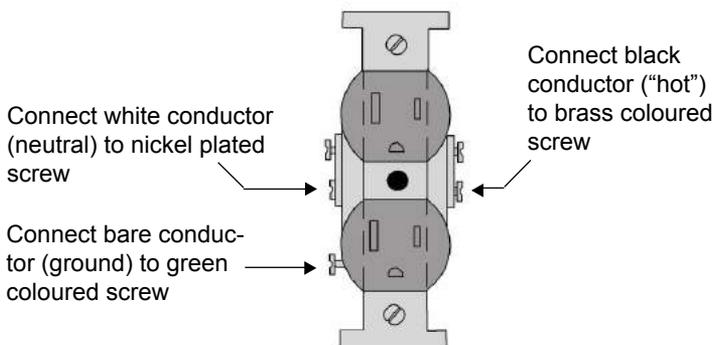
Are there any special requirements for outside receptacles?

Tamper resistant receptacles located outdoors must be protected with an approved ground fault circuit interrupter of the class A type. The GFCI device should be tested occasionally, as recommended by the manufacturer, to ensure proper operation.

What wiring must be ready before calling for an inspection?

The underground conductors between the house and the garage or shed must be installed in a trench. If mechanical protection is used, it must be in position. The trench may be backfilled in the centre provided the ends of the trench are left open for inspection purposes. Before the walls or ceiling of the garage or shed are insulated or covered with wallboard or other material, an inspection of the rough wiring is required. To schedule an inspection, call 204-986-5300.

FIGURE 14 - Duplex Receptacle Connections.



Also note the difference on the face of the receptacle. The neutral side has a larger slot than the "hot" side of the receptacle.

Note:

All standard receptacles configured 5-15R and 5-20R shall be of the tamper resistant type.

NOTE: The following information is provided to assist you in avoiding some of the more common errors which are made in interior wiring. Please recognize that this information is not intended to cover all of the applicable electrical regulations of the City. More detail regarding these regulations may be determined by referencing the City of Winnipeg Electrical By-law.

How should duplex receptacles be connected?

When connecting duplex receptacles please note that all receptacles are polarized (see FIGURE 14). That is, the black or “hot” wire must be connected to the brass coloured screw terminal. The white or neutral conductor must be attached to the nickel plated screw terminal. The ground conductor for the circuit must terminate under the ground screw in the outlet box and then must be carried out and be terminated under the green grounding screw on the receptacle.

Are there requirements for the installation of wiring in structural members such as studs in a wall?

Yes! Cable running through stud members must be kept as least 32 mm (1 1/4 in.) from any face of the stud which can be nailed upon. If this distance cannot be maintained, a protection plate is required in the area where the wiring passes through the stud. This protection plate must be at least 16 gauge metal (see FIGURE 15).

How must cable be supported?

Cable must be secured within 300 mm (12 in.) of the outlet box and approximately every 1.5 m (5 ft.) throughout the run (see FIGURE 16).

FIGURE 15 - Cable Protection.

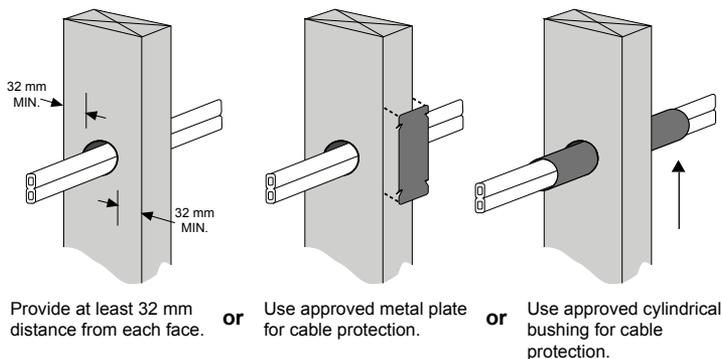
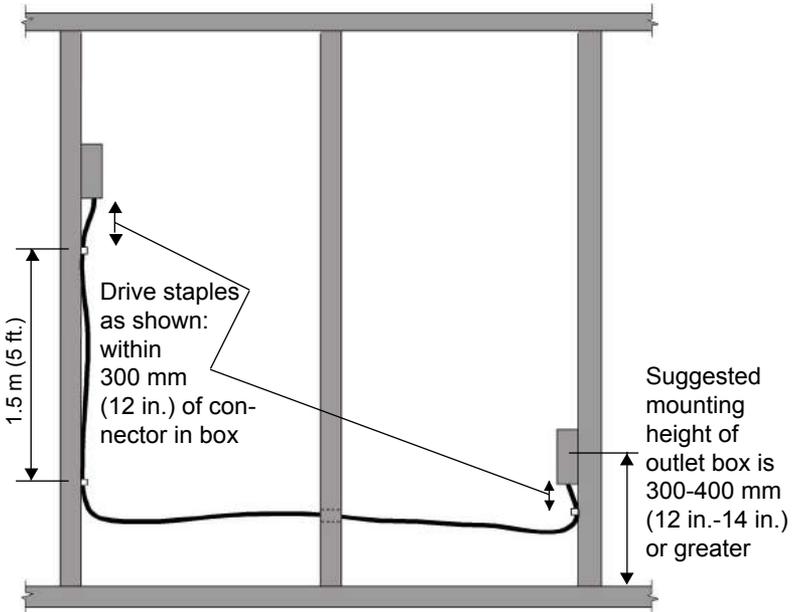


FIGURE 16 - Cable Support.



Are there any particular requirements for connecting light fixtures and switches?

Yes! For fixtures with screw terminals, the black or “hot” wire must be terminated under the brass coloured screw terminal and the white or neutral conductor must be terminated under the nickel plated screw terminal. For light fixtures in general, you must ensure that the white conductor is connected to the fixture screw shell (see FIGURES 17, 18 & 19).

Switches must always be connected to the “hot” conductor.

Are there any particular requirements for installing outlet boxes?

Yes! Mounting nails or screws can pass through the interior of an outlet box only if the nails or screws are located within 6.4 mm (1/4 in.) of the back or ends of the box. In addition, the nails or screws must not interfere with conductors or connectors (see FIGURE 19).

Openings placed through vapour barriers for the installation of outlet boxes must be effectively sealed to maintain the integrity of the vapour barrier.

FIGURE 17 - Light Switch Control Method

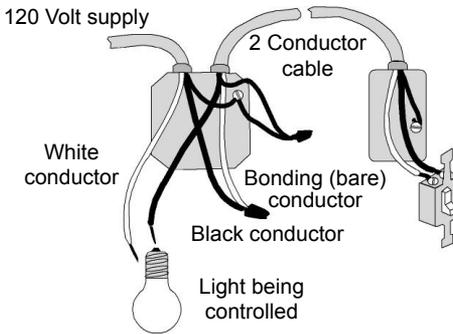


FIGURE 18 - Light Switch Control Method

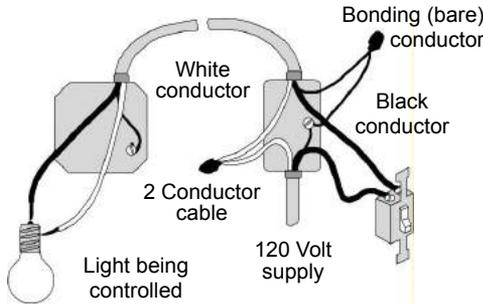
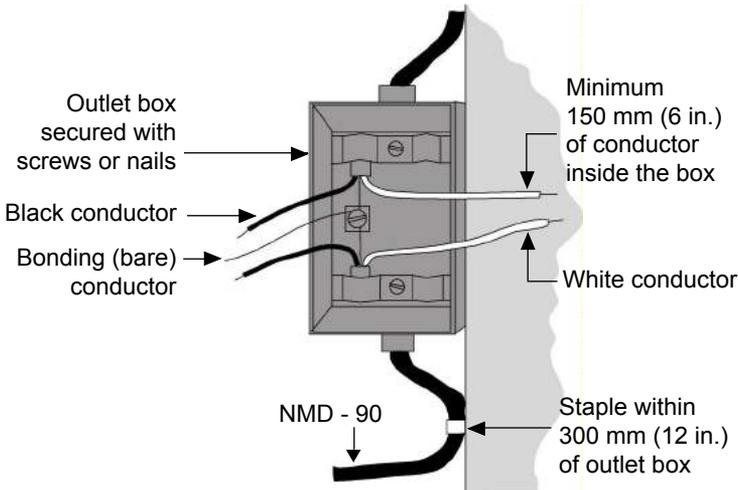


FIGURE 19 - Typical Outlet Box Installation.



Who enforces all of these requirements?

The Housing Inspections Branch of the City of Winnipeg Planning, Property and Development 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 Inspection Branch does not have the authority to waive code or by-law requirements but it does have the authority to accept equivalencies which meet the intent of the code or by-law. If you feel you can satisfy a code or by-law requirement by using an equivalent material or construction method, contact your Housing Inspector.

NOTICE:

Precautions should be taken to avoid gas service lines from being enclosed in or under buildings as per CSA Z184 Gas Pipelines Systems Standards. Additionally, care should be taken when excavating to avoid disturbing other underground service lines including telephone cables and electrical power cables.

Before proceeding with construction or any underground excavation, please contact:

- Manitoba Hydro at 1-888-624-9376 for gas and hydro lines,
- MTS at 1-800-837-6448 for telephone lines, and
- Shaw Cable at 1-866-344-7429

APPENDIX A

TABLE 8 - Wood Lintel Substitutions

From Table	Structural Composite Lumber (SCL)
3 - 2 x 8	2 - 1 ³ / ₄ " x 7 ¹ / ₄ "
2 - 2 x 10	2 - 1 ³ / ₄ " x 7 ¹ / ₄ "
3 - 2 x 10	2 - 1 ³ / ₄ " x 9 ¹ / ₂ "
2 - 2 x 12	2 - 1 ³ / ₄ " x 9 ¹ / ₂ "
3 - 2 x 12	3 - 1 ³ / ₄ " x 9 ¹ / ₂ "
4 - 2 x 12	2 - 1 ³ / ₄ " x 11 ⁷ / ₈ "

Notes to TABLE 8

- 1) To be used in dry service conditions and standard duration of load.
- 2) Working stress design properties:

Modulus of Elasticity 2.0 x 10⁶ psi
 Allowable Bending Stress 2800 psi
 Allowable Shear Stress 250 psi
 (perpendicular to glueline or wide face of strand)
 Allowable Bearing Stress 500 psi
 (parallel to glueline or wide face of strand)

APPENDIX B*Permit applications requiring additional information*

Listed below are certain instances where additional information, including plans, may be required for a permit application to build a detached accessory structure.

An asterisk indicates situations where a design (plans or letter) under seal of a registered professional engineer will also be required

Additional information for the construction of an accessory structure will be required when:

1. The area of the new accessory structure's foundation will be greater than 70 sq. m. (753 sq. ft.). * Note: For more information on the foundation requirements for accessory structures including those for the foundation of an addition to an existing accessory structure see page 9.
2. The accessory structure will be supported on wood mudsills (e.g. no concrete floor). The method of anchorage of the accessory structure to the ground in order to prevent wind uplift will have to be indicated. *
3. The foundation is to include retaining walls (wood or concrete) in order to hold back earth because the lot where the accessory structure will be located is not level. Or other instances where concrete walls higher than six inches will be constructed on top of a slab. *
4. If the accessory structure will have an irregular shape (i.e. not square or rectangular), beam and foundation details may be required. (Engineering design may also be necessary).
5. The accessory structure will not be "standard wood frame construction". Any of several alternative construction methods including: post and beam, concrete block, brick (including brick veneer) or metal frame construction (including steel studs), will have to be designed by an engineer.*

6. The wall height of the accessory structure will be greater than 3.0 m (9 ft. 10in.).*
7. A steel lintel will be used instead of a wood lintel for the overhead door of the accessory structure.*
8. The roof of the accessory structure is to be framed with “home made” trusses. *In this case, the design will have to be sealed by a registered professional engineer.
9. The accessory structure will have a gambrel or a mansard roof type. *Plans will also be required for roofs that have an octagonal or similar circular shape.
10. The accessory structure will have attic storage space. Plans will be required.*
11. A dormer will be constructed on the roof of a new or existing accessory structure. Plans will be required.
12. A beam will be located in the interior of an accessory structure to support a roof with slope of less than 1 in 3 or for support of hoist. * (Or similarly, where an interior wall or interior posts will provide support for the structure.*)
13. A deck is to be located on the roof of a new or existing accessory structure, such as a detached garage. All building code requirements for decks will have to be met. Also, the Zoning requirements for building height and location will have to comply. Plans for the entire structure, including the foundation, will be required. The foundation design will have to be determined to be adequate. *
14. The accessory structure will be two-storey. In this case, plans for the entire structure, including the foundation, will be required. Additionally, the foundation design will have to be engineered. *Zoning requirements for height must also comply.
15. A detached accessory gazebo or similarly occupied structure is to be located on top of an existing deck. Here the plans will have to indicate the design of the new gazebo. It will have to be shown how the existing deck joists, beams and foundation will provide proper support under the new gazebo walls and will also anchor down the new structure to prevent wind uplift.

16. Construction plans will be required for all detached carports. Detailed information must be provided on the roof framing, the number of posts, the post foundation and the size of the beams over top of the posts. *Engineering may be required.
17. An accessory structure is to be constructed adjacent to an “up and down” duplex. Limiting distance calculations will be required. The limiting distance calculations are required in order to limit the spread of fire between an accessory structure and dwellings on the same property. The limiting distance calculations will determine how close the accessory structure can come to the dwelling units and what materials can be used in the construction of the accessory structure.

Construction plans will be required for this type of accessory structure including elevation drawings. The elevation drawings must show window locations, type of cladding (e.g. stucco, siding, etc.) and dimensions of the wall facing the dwelling. Information will also be required for the wall of the dwelling that faces the accessory structure. The information that will be required for the dwelling wall includes an elevation drawing showing: wall height, wall width and area, type of wall construction (e.g. wood frame), size of all windows in the wall and type of wall cladding

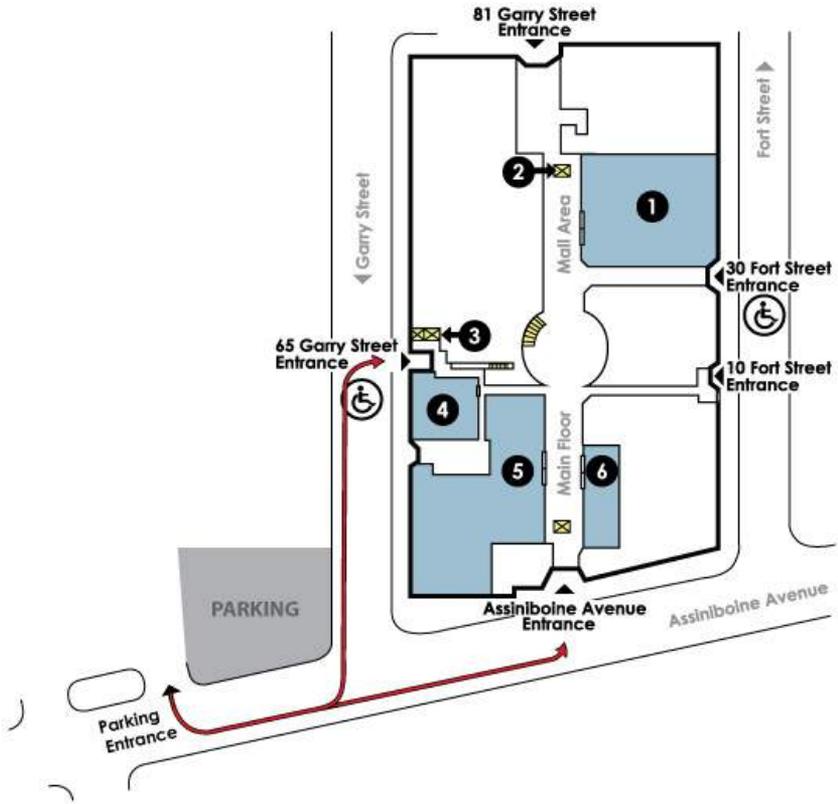
NOTES:

- *In order to determine what the necessary limiting distance requirements will be for your particular project and provide the required plans, applicants are advised to retain the services of an engineer, architect, or other qualified person.*
- *Other accessory structure construction designs that are not specifically identified above may also require additional information including engineering. Contact the Plan Examination Branch for more details at 204-986-5140.*

In-Person Customer Service Hours are:

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.





For more information on the regulations for detached garages and storage sheds please contact:

**Zoning and Permits Branch
& Plan Examination Branch
PH: 204-986-5140
FAX: 204-986-6347**

**Housing Inspections Branch
PH: 204-986-5300
FAX: 204-986-2008**

or



**Winnipeg
at your service.**

City of Winnipeg
Planning, Property and Development Department
Unit 31 - 30 Fort Street
WINNIPEG, Manitoba
R3C 4X7

www.winnipeg.ca/ppd
