Detached Garage Design Guide

Section 1 Introduction

This guide provides information for consideration to support you in obtaining permits to construct a detached covered parking structure--garage or carport--in Edmonton. Plans can vary greatly, and not every conceivable situation is anticipated in this guide. If the nature of your project differs from what you read here, and you are not familiar with the applicable requirements, obtain assistance from a knowledgeable person or the permit office.

The information provided is to assist you in planning a project to comply with regulations and obtain permits. It is not a construction manual. The text and diagrams illustrate principles; other methods of satisfying the requirements may be equally valid. National Building Code (Alberta Edition) (NBC(AE)) requirements govern. Obtain free digital access to NBC(AE) and also to the Illustrated User's Guide-NBC2015 for Part 9 from Codes Canada Publications.

Where a roofed structure used for the storage or parking of vehicles has more than 60% of the total perimeter enclosed by walls, doors or windows, it is considered a garage; otherwise it may be termed a carport. Light household attic storage is sometimes desired in a garage: storage is not considered a storey when limited to 1.45m high, accessible by a hatch or ladder. Proposals for stairs or greater heights require drawings for review to determine whether the building will actually be two storeys in height, which gives rise to additional code requirements.

A typical garden suite (laneway house or garage suite) is not an accessory building; it is a house, with or without an attached garage, and must meet Code requirements of NBC(AE):B:9.10.15. for houses. Read edmonton.ca/gardensuites. Non-standard accessory buildings may include a variety of functions such as private swimming pool, hobby spaces, home-based business space, etc., all under one roof with or without an accessory garden-suite dwelling unit; the design may possibly have to comply with NBC(AE):B:9.10.14.

Plan Ahead

- **CLICK-Before-You-Dig** -OR- **DIAL-Before-You-Dig** 1(800)-242-3447 for no-cost utility marking through the Alberta One-Call Corporation system.
- Services should not generally be located under buildings. Check with ATCO about building over their underground gas line supplying the gas meter on your property; they may propose relocation or other remedies to building on top of it. Check with Epcor where underground electrical lines from supply to meter are located where you want to build.
- Overhead power lines must be at least 3.5m (11' 6") above a driveway or walking surface and clearance from a roof plane or above a ridge is to be a minimum of 1m. Check with Epcor where overhead electrical lines from supply to meter are located where you want to build.
- Consider future plans or projects when planning where the garage or shed is constructed so changes are not needed at a later stage of development.
- Construction must be resistant to deterioration due to exposure to the elements or in contact with concrete or soil. Read about handling treated lumber here and here. Use treated-lumber compatible fasteners. Read about concrete requirements in the Foundations section below.
- Reduce water damage risk by locating downspouts strategically.
- Building materials, appliances and equipment on the building site must be stored in such a way as to prevent the deterioration or impairment of their essential properties.
- Used materials, appliances and equipment are typically permitted to be reused when they meet the requirements of this Code for new materials, appliances and equipment and are satisfactory for the intended use.
- Retain appropriate help if you are not able to plan and/or construct this project.
- A permit is not required to place a concrete parking pad for a future garage or accessory structure, but ensure that it meets applicable zoning and building code requirements as to size, distance to property lines and other structures on the lot, and is of appropriate thickness and material. If not, it may prove unacceptable when time to place the building on it.
- Follow National Building Code 2019 (Alberta Edition) when designing and building any structure. Metric units are used for alignment with Code requirements; acceptable equivalent imperial dimensions are provided where appropriate. Every project is unique. Commentary and clarification is for information only and may not apply to conditions or circumstances specific to a particular project.
- The National Building Code 2019 (Alberta Edition) is referred to as 'NBC(AE)' or 'Code' in this guide; refer to it for exact wording and final determination of compliance.

While care has been taken to confirm the accuracy of information contained in this guide, its purpose is informational and not an official interpretation of all codes, standards and resources available. Text and diagrams illustrate principles; other methods of satisfying the requirements may be equally valid. If there are cases where text in this guide conflicts with a requirement in the NBC(AE), the NBC(AE) requirement governs. It is the responsibility of any person undertaking design and construction to comply with NBC(AE).

Section 2 Permits

Permits for a detached garage or carport--when and why

Home Improvement Permit: Development Permit and Building Permit combined

A development permit is written approval issued by the City of Edmonton to document that a proposed development meets the Zoning Bylaw requirements.
A building permit documents a project from the permit application stage, through the construction stage to completion. An application for permit, accompanied by proposed project plans and specifications, is reviewed to an extent commensurate with the size and complexity of the project. The work authorized by an issued building permit is inspected at least once: an audit to verify the work is conducted in accordance with the permit plans/specifications, the Safety Codes Act, and Edmonton Safety Codes Permits Bylaw 15894. See Section 8, below.

Every detached parking structure requires a development permit and a building permit. For home improvement projects in Edmonton, such as for a garage or carport, the required development permit and building permit are combined into a single document--a Home Improvement Permit (HIP), **specifically** for work associated with Houses, Semi-Detached Houses, and Row Houses **only**. A detached parking structure serving any other type of building will be processed as a Commercial Building Permit, and adhere to the requirements associated with that type of permit application in addition to considering what is written in this guide.

Projects on a condominium site require written permission of the condominium be provided.

Trade Permits

Trade permits are permits required for work on heating and ventilating, plumbing, gas and electrical systems. These are compulsory certification trades where, with few exceptions, journeypersons are required to perform the work due to its complexity and associated potential hazards.
A homeowner may apply for a trade permit for detached garage or carport work **only** if the garage or carport is intended to serve a Single Detached House; the owner resides in the residence associated with the project, and the owner will be performing the work personally.

Trade permits associated with the project are to be applied for when applying for the building permit itself. There is an option to select a homeowner permit for some work, or indicate that a tradesperson will perform the work. If no tradesperson is chosen at the time of permit application, there is a further option to come back and provide that later, online, after the HIP is issued but before the trade work is done and requires inspection.

Drawings for a detached garage or carport--when and why

A building permit application is accompanied by plans and specifications of the proposed project, and fees. Plans and specifications are the drawings, documents and details that communicate the aspects of the project under review through the application, permits and inspections process to audit compliance with applicable zoning and building safety rules.

No drawings are typically required for a conventional wood-framed rectangular single-storey detached **garage** with engineered roof trusses--sometimes referred to as a 'garage package'--serving a single detached house, with or without a secondary suite, so long as the specifications provided in the application for the proposed garage meet tests for compliance with the Zoning Bylaw and construction solutions of the Code. When the selected specifications indicate a need for specific supplementary documentation, a site plan, architectural drawings, and/or structure and engineering documents must be provided, as explained further in this guide.

In other cases, the following are the minimum requirements to support an application.

Site Plan

A Site Plan is to be prepared to scale, preferably a Real Property Report or Plot Plan, indicating:

- Address, north arrow, street/avenue and alley;
- All existing and proposed structures, showing dimensions and distances to property lines;
- Dimensions and location of existing and proposed site accesses, including hard surfacing.

A site plan shows the entire existing property, existing structures, and the location of the proposed detached garage or accessory building. It is not recommended to rely on the position of sidewalks, alleys or fences to locate a property line. You may have a recent Real Property Report with your mortgage papers that will provide evidence as to where the project may be located. For greater certainty, hire a qualified Land Surveyor and reduce the risk of an adjacent property boundary dispute.

A site plan is **not** required when the proposed detached garage is on a property that contains **only** a Single detached House following issuance (if applicable) of a separate permit to demolish any existing garage and other accessory structures. In this case, key dimensions of and between the house, proposed garage and property lines must be provided on the application form.

Architectural Drawings

Provide minimum 1/8"=1'-0" [1:100]; Preferred 3/16"=1'-0" [1:75] plans if/as required for:

- Floor plans, showing any interior partitions, stairs or exterior stairs;
- Elevation drawings, showing height and dimensions of building;
- Sections and details.

Architectural drawings are **not** required when the proposed detached garage is a rectangular one-storey wood-framed structure serving a single detached house, with or without a secondary suite. In this case, key dimensions and characteristics of the building must be provided directly on the application form.

Structure and Engineering Documents

Structure details are **not** required when the proposed detached garage is conventional wood-frame construction with a roof of engineered trusses designed and manufactured for the

Edmonton area. In this case, key information about the building must be provided directly on the application form. The engineered truss design placement diagram (layout) including any beams/lintels, design drawings and supplier letter must be available on site at time of inspection.

Provide structure drawings, and/or engineer-stamped plans and specifications applicable to the project where the design cannot be verified in Part 9 of the Code:

- Foundation details (concrete slab, footing and frostwall, grade beam and pile, preserved wood foundation, other);
- Beams/Lintels (steel, engineered lumber, non-uniformly-loaded built-up beams, etc);
- Roof and floor layouts (placement diagram(s), design sheets, supplier's letter) and installation guide; or
- Framing sketches for stick-framed roofs or floors, showing compliance with NBC(AE):B:9.23.

Section 3 Detached Garage Design Considerations

Function

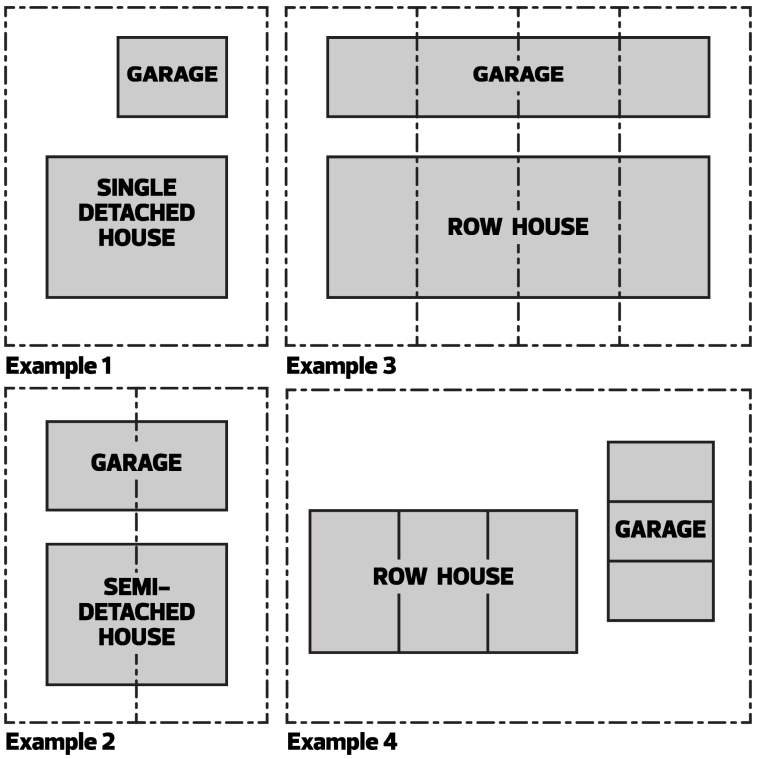
A detached garage or carport is intended primarily for the parking of motor vehicles, and secondarily may be used for light storage of low-hazard personal and household goods. If constructing a detached parking structure (or any accessory building) with a plan to subsequently change its use to another, the building will be reviewed again in the context of the new proposed use at the time of permit application for the change. 'Change of use' is not in the scope of this guide, however an owner should be aware that there are some Code provisions for garage proximity to the dwelling it serves that are less stringent than when a different use of the garage is proposed such as a home-based business, additional dwelling or commercial premises.

Serving a Single Detached House

Example 1: Where the detached garage or carport serves only one dwelling unit or a House with a secondary suite, and is located on the same property as that dwelling unit, there is no restriction to the amount of windows/openings on the building wall that effectively faces the house and vice versa, provided the dwelling unit served by the detached parking structure is the only major occupancy on the property.

Serving a Semi-detached or Row House

A mutual or shared detached garage is one constructed for use by more than one user, typically but not necessarily divided



internally into multiple compartments for security of property and/or fire protection.

Examples 2 and 3: Where a shared garage serving dwellings is built over a property line, such as associated with a fee-simple Semi-Detached or Row House, any party wall within it constructed on the property line is to be constructed with a minimum 1h fire-resistance rating providing continuous protection from the floor tight to the underside of the roof deck including through all concealed spaces. A single building permit only is required for this style of detached garage, so long as it is constructed in one project (not in stages).

Example 4: Where the detached parking structure does not directly face only the dwelling it serves, but is located facing another building or another part of the building it serves, more stringent requirements (NBC(AE):B:9.10.14.) apply.

Serving a structure other than a House

If such a detached parking structure exceeds 500 sq.m in building area on one storey (or 250 sq.m on two storeys), then all required drawings must be stamped by architect or engineer, as applicable. In this case, a site plan establishing the proposed location, architectural drawings showing the appearance and the materials of construction, and structure and engineering documents detailing the structural elements must be submitted for permit processing.

Carport

Where a roofed structure used for the storage or parking of vehicles has more than 60% of the total perimeter enclosed by walls, doors or windows, it is considered a garage. Whether freestanding or part of the new garage, a permit is required for the carport. A site plan and structure details for post foundations and posts, any roof beams and anchorage/connections, and roof framing will be required. Due to the variable nature of carport designs, architectural drawings are required for review to ensure that appropriate eave and wall treatments are proposed.

Location

An intent of the Code is to inform design and construction for a desired location such that, to an extent reasonably practical, the risk of spread of fire from the garage or carport building to any other building is minimized. This is achieved in part through limits placed on wall construction, position and size of windows, and eave (roof overhang) characteristics. The limits are distance-based, and can be referenced through “limiting distance”.

‘Other building’ means one on an adjacent property or on the same property. In the case of an adjacent property, the limiting distance is measured to the property line, whereas measurement is made to an imaginary limiting distance between two buildings on the same property. That limiting distance line or property line, as the case may be, is then referenced from both sides for required construction characteristics set out in the Code.

The following are general requirements for a detached garage, while two additional site-specific rules are outlined below this list.

- Any roof soffit (eave overhang) extending within 1.2m of a limiting distance/property line must have no openings to the attic/roof space or interior of the building. The typical solution is to install non-perforated prefinished aluminum soffit material, with CAN/CGSB-93.2-M label.
  Other acceptable materials to use, listed with minimum thicknesses, are:
  11mm thick plywood or lumber;
  12.5mm thick OSB or waferboard;
  12.7mm thick gypsum soffit board/ceiling board installed per CSA A82.31-M; or
  0.38mm thick sheet steel.
- Any roof soffit (eave overhang) may extend no closer than 0.45m of a limiting distance/property line. For example, if the detached garage or carport is situated at 0.6m to the property line, the roof overhang may not be more than 0.15m. In no circumstances may two roof overhangs be within 0.9m of one another.
- No window or glazed door is permitted on any structure wall closer than 1.2m to a limiting distance/property line.

Reduced or Zero Lot Line location

Exterior side yard wall and side yard-facing gable of a detached garage or carport serving a Single Detached or Semi-Detached House with a reduced lot line or zero lot line must be considered. To obtain a building permit, a variance is required where building eaves are proposed projecting too close to or over a side property line. Policy B14-01G, a city-wide variance, allows avoidance of a unique specific variance for this condition or having to reduce or eliminate eaves (roof overhangs) from the building. Installation of ⅝" Type X gypsum board to the inside face of garage sidewalls and any gable end above the sidewall, **if** the policy-related "deemed limiting distance" is less than 0.6m, satisfies the requirement.

Outside-10-minute fire department response time location

There are areas in the City where, due to the potential travel time needed for fire department response, Code requires that the building characteristics be adjusted. These are termed 'Outside -10' areas. In the case of a detached garage, installation of ⅝" Type X gypsum board to the inside face of garage sidewalls and any gable end above the sidewall where the distance to the property line is less than 1.2m satisfies the requirement. Depending on the location of a multi-user detached parking structure, additional considerations for limiting distances even greater than 1.2m must be reviewed, as effectively double the physical distance value is applied in considering windows, cladding and fire-rating of walls where 'Outside-10'. See NBC(AE):B:9.10.14.

Services: electricity, gas and plumbing

A detached parking structure may not be built over a primary gas line without prior written approval of the utility provider. Check with ATCO about a detached parking structure over their gas line supplying the gas meter, and any questions about attaching the gas meter to the building and serving the house on a secondary line from there. No secondary gas line may be located under a garage floor-on-ground slab.

A primary buried power line may not have a detached parking structure built over it. For aerial lines, clearance of at least 3.5m (11’ 6”) above the driveway/apron to electrical wires is required. Wires must clear a ridge or any point on the roof by a minimum of 1m (40”). Check with Epcor about specific conditions if necessary, and with questions about attaching the power meter to the building and serving the house on a secondary line from there. Secondary lines are permitted under a floor-on-ground concrete slab under specific conditions as required by the Canadian Electrical Code.

It is recommended that a detached parking structure not be built over a sewer line and water service line, in the event of later line troubles, however it is not prohibited. It may prove useful to have a line’s condition scoped before building, in the event that replacement is indicated. Sewer and water lines not on road right-of-way are not typically the responsibility of the utility.

Consider future plans or projects when planning where the building is constructed so changes are not needed at a later stage of development.

Section 4 Foundation

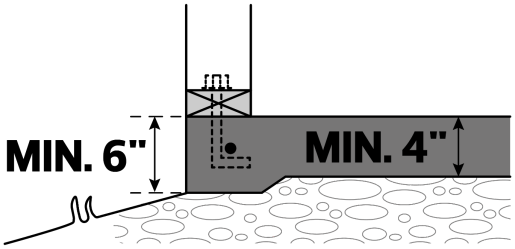
A foundation is required for a detached garage or carport. Concrete is the typical material used for garage floors and for foundations. If you are not familiar with masonry construction, we strongly recommend you use a reputable contractor to prepare the site, and design, mix, place and cure the concrete elements while accounting for potential for disturbed ground, sulphate soil, freeze/thaw, and chloride exposure, plus any site-specific conditions.

“R” class concrete requirements per the CSA A23.1 Standard inform ‘ready-mix’ suppliers in addition to Code stipulation of compressive strength and water ratios to support desirable outcomes. NBC(AE):B:9.3.1. provides details for concrete mixed on site. In either case, the unreinforced or nominally reinforced (for crack control) concrete 28th-day minimum compressive strength is to be 32MPa for garage floors, and 15MPa for footings, foundation walls, grade beams, columns and piers. Concrete for engineer-stamped foundation and/or floor designs is to be specified on the engineering document(s).

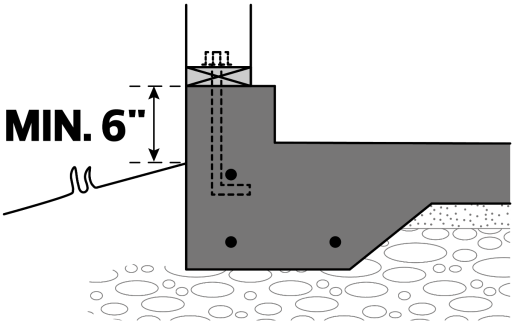
Innovative foundation systems may be proposed; they must be with a CCMC evaluation report or site-specific engineer-stamped design for review.

Concrete 'slab' floor-on-ground for small garage

For a one-storey residential detached garage with a building area less than 55 sq.m (~592 sq.ft), a concrete floor-on-ground ('slab') that is at least 100mm (4") thick **may** be used as a **foundation and floor** in combination, provided the garage itself is not made of masonry or masonry veneer. Thickening the slab perimeter has been observed to increase concrete floor robustness to counter seasonal temperature swings, better sustain vehicle weight at the overhead door, provide adequate depth for anchor bolt embedment, and allow greater ground clearance to wood framing without the finished landscape surface being lower than a straight 4" slab.



CONCRETE SLAB



THICKENED SLAB

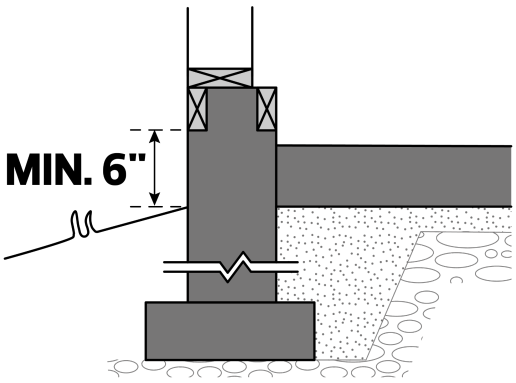
Foundation drainage requirements set out in NBC(AE):B:9.14 are waived for this foundation/floor, where the ground will be graded away from the garage. If such grading is not possible, take steps to protect wood framing of the building by integrating curbs into the design.

If future conversion of the detached garage to liveable space is planned, consider engineered design now as an engineering review of the above slab will eventually be required (as the building would no longer be only a detached garage serving a dwelling). You may submit the design with the permit application, but also retain a copy for future reference, as the City is not obligated to retain drawings in perpetuity.

A detached garage 55 sq.m or greater, supporting a second storey and/or a roof-top deck **must** be supported on a standard foundation. Some options are discussed here.

Footing and frostwall

Foundations are to extend down to undisturbed soil and below frost level. As a detached garage will not typically be heated, at least 1.5m depth to the bottom of the footing from the finished ground level is prudent, however that depends on soil and ground water conditions. See NBC(AE):B:9.12.2.



FOOTING & FROSTWALL

Footing size depends on the number of storeys supported, their type of wall construction, and soil bearing capacity. For a conventional wood-framed single-storey detached garage, typical continuous concrete strip footings are to be minimum 250mm wide

and minimum 100mm thick, increased to 315mm wide if brick/masonry to be used as exterior wall cladding over the wood-frame. See NBC(AE):B:9.15.3.

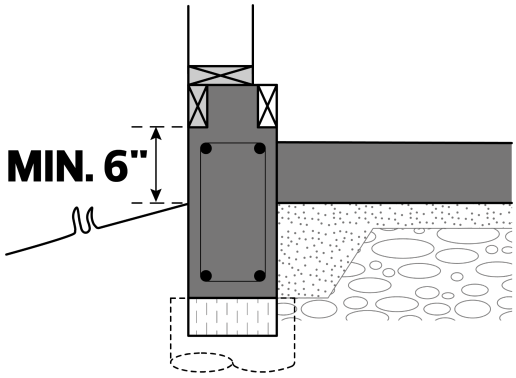
The frostwall is typically made of concrete placed into forms, however there are other potential concrete-based options including permanent insulating concrete forms (ICF) and concrete block (CMU). The concrete frostwall is to be of minimum 150mm (6") thickness, and project at least 150mm above the finished ground level for wood wall-frame moisture protection.

Typically, the strip footing will be constructed at least 400mm wide, with a 200mm frostwall or 140mm ICF frostwall centered on it.

Engineered foundations

Site-specific engineer-stamped design is required for other types of foundations that include the following:

- Engineered concrete slab floor-on-ground to support a detached garage not meeting the 55 sq.m exception listed above;
- Suspended structural slab, where there is crawlspace or basement under the parking area;
- Grade beam and pile design, with piles of concrete or metal (helical piles, torque piles or screw piles);
- Preserved wood foundation on gravel base or concrete footing, due to complexity; or
- Piers for carport columns plans, not commonly used today, where Code requirements per NBC(AE):B:9.35.3.4. cannot be clearly communicated on detailed drawings submitted with the application.



GRADE BEAM AND PILE

Section 5 Walls

A detached parking structure is considered to be a garage if more than 60% of its perimeter wall area is enclosed. A detached garage must have at least one exterior **egress** doorway with any installed person-door hinged on a vertical axis. An opening for a vehicle with no door, such as in a carport, may serve this purpose, but where a garage door is installed the person-door is also required.

The building must be **anchored** to prevent shifting, uplift or overturning in high winds. For wood frame walls, this is typically done by fastening a sill plate to the foundation with not less than 12.7mm (½") diameter anchor bolts spaced not more than 2.4m (~8ft) o.c. set 100mm (4") into the foundation wall or slab. Alternatively, for a grade beam projecting above the level of the garage floor slab, anchorage may be provided by 2-2"x4" sill plates placed on edge and separated by blocking spaced 1.2m (4ft) o.c. ('ladder board') embedded in the top of the concrete grade beam. Other wall types must also have an anchorage system in accordance with the Code.

Carport columns and their anchorage must be detailed to conform to NBC(AE):B:9.35.4. and submitted with the application.

Wood frame
Wood frame walls are made of vertical framing members--studs spaced no more than 600mm (24") apart--which support exterior sheathing and cladding, building services such as electrical wiring, and interior finishes. Studs also support roof and other floor loads and transfer them to other walls, beams or foundation.

Framing base plate lumber closer than 6" to the ground must be treated with preservatives, including at cuts, to prevent premature deterioration. Separate it from concrete in contact with the ground by 0.05 mm (2-mil) polyethylene film or roll roofing

Typical framing lumber used in Edmonton is #2 grade and better of mixed spruce/pine/fir, denoted with lumber grade stamps as S-P-F #2 & better. See NBC(AE):B:9.23.10.-13. (and their associated provisions) for more information; the commonly-used wall framing options are:

- 2"x4" or 2"x6" stud @ maximum 24" o.c. for a wall up to 3.0m (9'10") high; and
- 2"x6" stud @ maximum 16" o.c. for a wall up to 3.6m (11'10") high only.

Note: site-specific engineer-stamped design is required for walls more than 3.6m (11'10") high.

Other
Less common wall construction methods include insulating concrete form (ICF) or concrete block (CMU) per NBC(AE):B:9.20. These impact the foundation to be provided, so ensure your planning is integrating all aspects of the structure.

Site-specific engineer-stamped design is required for buildings with walls that are with

- Post and beam, except for carport columns/beams/connections detailed per NBC(AE):B:9.35.4.;
- Structural steel stud; or
- Structural insulating panels (SIP) (see Standata).

Innovative wall systems may be proposed; they must be with a CCMC evaluation report or site-specific engineer-stamped design for review.

Wall openings, including overhead door lintel
Lintels, beam-like framing sometimes called headers, support and transfer loads above a wall opening in a wood-frame wall to the studs that flank the opening. All exterior walls of a typical garage are loadbearing. Lintel selection depends on width of the opening, supported load, and selected lintel material. See NBC(AE):B:9.23.12.

Any lintel exceeding 3m (10ft) in length in a wood-frame wall must be supported by at least 2 studs under it as well as one flanking extending to the top plate of the wall in which the opening is situated.

Overhead Door Beam (Lintel)
Where manufactured roof trusses are to be used on a garage or carport, it is common for the supplier to also calculate and provide adequate lintels to safely but economically carry the roof

loads bearing on walls over openings. This is particularly true for large, typically overhead, vehicle-door openings, as engineered structural composite lumber (**SCL**) products, which differ from dimensional sawn lumber used for studs and so on, must be selected through analysis as they are not in charts in the Code. Where lintel design is included with the engineered roof truss package, the site-specific supplier's letter, design drawings, and placement diagram shall be available on-site for review by a safety codes officer (inspector) at any inspection.

Where SCL lintel design is not included with the roof truss package, a separate site-specific supplier's letter, design drawing, and placement diagram is to be available on-site for review by the inspector, or provide site-specific engineer-stamped SCL lintel design.

Where sawn dimensional lumber is used, the following (S-P-F #2& better), as applicable, are satisfactory lintels for the two most common garage vehicle-door sizes.

Up to 9 ft wide overhead door (S-P-F#2+better)

Minimum 2-ply 2"x10" supports gable end including eave overhang beyond lintel

Minimum 2-ply 2"x10" supports up to 12 ft of roof load including eave overhang beyond lintel

Minimum 3-ply 2"x8" supports up to 12 ft of roof load including eave overhang beyond lintel

Minimum 3-ply 2"x10" supports up 16 ft of roof load including eave overhang beyond lintel

Up to 16 ft wide overhead door (S-P-F#2+better)

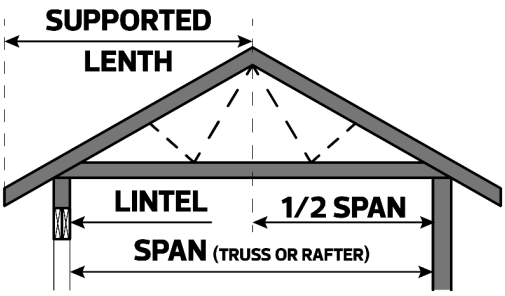
Minimum 2-ply 2"x10" supports gable end and eave overhang beyond lintel

Minimum 3-ply 2"x12" supports up to 8 ft of roof load including eave overhang beyond lintel

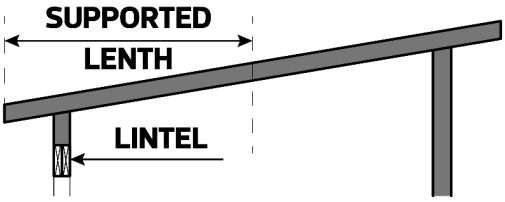
Minimum 4-ply 2"x10" supports up 10 ft of roof load including eave overhang beyond lintel

Minimum 4-ply 2"x12" supports up to 12 ft of roof load including eave overhang beyond lintel

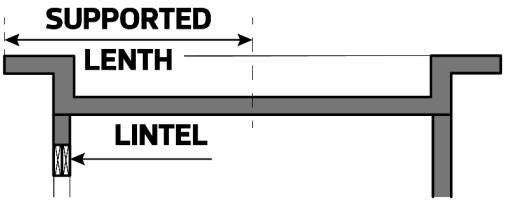
Where greater roof load is supported **or** SCL lintel preferred, provide site-specific engineer-stamped design if the lintel is not designed by a supplier in accordance with Standata.



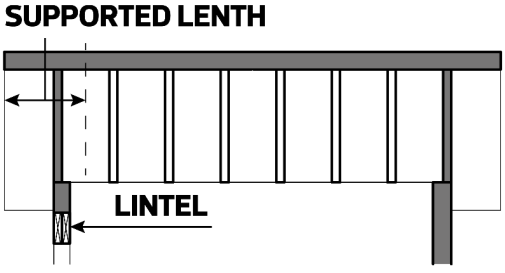
GABLE / HIP ROOF



SHED / MONO ROOF



FLAT ROOF



GABLE END

If another lumber selection is desired, it is to be shown to be from Tables 9.23.4.2-L and 9.23.12.3.-A through -D of the Code, or from The Span Book by the Canadian Wood Council. Site-specific engineer-stamped design is required for lintels of steel, rough-sawn timber, and other non-standard/innovative materials.

Wall sheathing
Sheathing strengthens walls to resist wind loads and impact forces. Sheathing is also required on exterior walls and gable ends when the exterior cladding requires solid backing or intermediate fastening between studs. Some claddings can be attached directly to the sheathing, if adequate, or to furring or blocking at right angles to the studs. Cladding thickness or furring size may depend on use of sheathing. NBC(AE):B:9.23.17. lists wall sheathings.

Where sheathing is not required to resist wind loads (panel-type cladding or interior finishing is intended), for cladding attachment, or for additional support for the cladding or strapping, it may be omitted, though this is seldom done as sheathing facilitates rapid building enclosure. Where not required, sheathing thickness limits in the Code do not apply.

Minimum ⅜" thick OSB or plywood sheathing is the typical material used, except minimum ½" thick is required for fastening of vertical lumber siding and stucco lath/reinforcing between supports. Minimum 17mm (⅝") thick lumber sheathing, with ends supported and joints staggered, is acceptable.

Gypsum board, insulating sheathing or fibreboard sheathing are not suitable for intermediate fastening of cladding between supports; as with where no sheathing is proposed, ensure the cladding and blocking/furring/strapping details are considered for the specific claddings that are to be attached to the wall frame. Check fastening specifications in the Code and manufacturer's installation instructions.

Innovative wall sheathing systems may be proposed; they must be with a CCMC evaluation report or site-specific engineer-stamped design for review.

Section 6 Roof

Most roofs are framed with manufactured engineered roof trusses, routinely designed and fabricated by specialty producers ('truss shop'). Conventional joist and rafter framing ('stick-framed') is still used, particularly if the design or features of the roof makes it more practical. If the roof surface is to be used as a walking surface/patio, then it is to be designed as a floor, which may equally be manufactured engineered floor system or a stick-framed system.

For any roof design, if the detached garage is to have a second storey, roof-top use, or high attic storage provisions then the 100mm (4") thick 'slab' floor-on-ground (per Section 4, above; NBC(AE):B:9.35.3.1.(2)) is **not** acceptable except by site-specific engineer-stamped design.

Manufactured roof truss framing
Manufactured engineered wood roof truss or I-joist and/or structural composite lumber components may be used without site-specific engineering in accordance with Standata 19-BCI-023; the site-specific supplier's letter, design drawings, and placement diagram shall be available on-site for review by codes officer at any inspection.

Trusses must be supported at the points intended in their design. No site modification--support location, cutting, notching or patching--is permitted unless approved and documented by the truss supplier/designer. Roof trusses are very strong in their intended vertical position when supported against buckling by the roof sheathing and web bracing indicated on the placement diagram (layout) and in the manufacturer's installation instructions. In a horizontal position, trusses are susceptible to damage; they must be transported, stored and lifted appropriately .

Other

Rafter and ceiling joist stick framing

Stick-built dimensional lumber roof plans of rafters, ceiling joists, with collar ties and/or beams as required per NBC(AE):B:9.23.14. must be submitted with the permit application. Site-specific engineer-stamped plans are **not** required when the proposal can be verified in Part 9 of the Code. Ensure lintel and beam sizing, load transfer to foundation, and footing details are included if applicable. See NBC(AE):B:9.23.14.

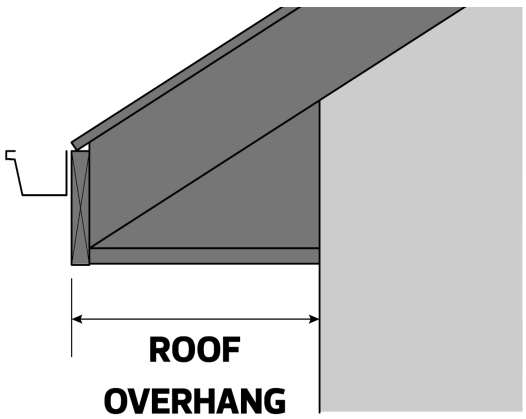
The Code Span Tables for rafters and roof joists are for roofing with relatively lightweight, asphalt-based roof coverings, wood shingles/shakes, or metal roofing; where clay or concrete roofing tile is to be used, the roof load is considerably greater. Ensure adjustment of framing (e.g., appropriately reduced span or spacing) and of foundations is shown on the required drawings. See NBC(AE):B:9.23.4.

Other

Innovative roof structure systems may be proposed; they must be with a CCMC evaluation report or site-specific engineer-stamped design for review.

Roof overhangs (eave projection)

Any roof soffit (eave overhang) may extend no closer than 0.45m (~18") of a property line, or a limiting distance line to another building on the same property, including the principal dwelling. For example, if the detached garage is situated at 0.6m (~23½") to the property line, the roof overhang may not exceed an additional 0.15m (6"). The same rule applies to all buildings, so there should never be a case where there is never less than 0.9m between the faces of two eave projections (overhangs).



Roof sheathing

Roof sheathing is used beneath roofing when the roofing material itself does not have sufficient strength to support anticipated roof loads, including workers, while resisting deterioration due to exposure under time of construction and potential cold-weather condensation.

If the roof is to be used as a walking surface/patio, then floor sheathing requirements apply, per NBC(AE):B:9.23.15.

Minimum ⅜" thick plywood or O2-grade OSB sheathing is the typical material used, except minimum ½" thick is required where edges are unsupported by framing, blocking or metal H-clips on supports spaced over 16" o.c. See additional options in NBC(AE):B:9.23.16. Minimum 17mm (⅝") thick lumber boards (of maximum 11" width), except minimum 19mm (¾") thick where supports are spaced over 16" o.c., with ends supported and joints staggered, is acceptable.

Innovative roof sheathing systems may be proposed; they must be with a CCMC evaluation report or site-specific engineer-stamped design for review.

Section 7 Finishing

Exterior

Doors and Windows

Windows and glass in doors are permitted only where placed in a wall that is at least 1.2m (4') from the property line of an adjoining property other than the street or public lane. The aggregate amount of glazing permitted is governed per NBC(AE):B:9.10.14. Limiting distance restrictions for glazing in walls in a detached parking structure facing a wall of the single detached house it serves on the same lot are relaxed in the Code where the house is the only other use (occupancy) of the property.

There are no controls on the combustibility of the exterior cladding, regardless of distance to property line/limiting distance line.

Roof overhangs (eave projections) must be treated as discussed in Section 6, above.

Roofing

Roofing is intended to keep precipitation and snow-melt from entering a roof space or attic by use of roof coverings, flashings and installation techniques appropriate for the roof configuration. The following are Code-listed options for roofing for a detached parking structure, with some limitations listed. See NBC(AE):B:9.26.

Asphalt Shingles

- slope 4:12 or greater 'Normal application' per NBC(AE):B:9.26.7. or CAN3-A123.51-M
- slope 2:12 or greater 'Low slope application per NBC(AE):B:9.26.8. or CAN3-A123.52-M for slope 2:12 to 4:12

Wood Roof Shingles or Shakes

- Slope 3:12 or greater Wood Roof Shingles per NBC(AE):B:9.26.9., 9.26.5. Western cedar shingles No. 2 grade and better.

- Slope 4:12 or greater Cedar Roof Shakes per NBC(AE):B:9.26.10., 9.26.5. Cedar shakes No.1 or Handsplit grade

Metal Roofing
Slope 3:12 or greater except if the profiled metal roof cladding system is specifically designed for low slope application and installed according to the manufacturer's written instructions. See NBC(AE):B: 9.26.13. Where this roofing is not supported on roof sheathing, provide a CCMC evaluation report or site-specific engineer-stamped design for review.

- Galvanized steel profiled sheet, min 0.33 mm thick
- Copper profiled sheet, min 0.46 mm thick
- Zinc profiled sheet, min 0.46 mm thick
- Aluminum profiled sheet, 0.48 mm thick
- Sheet metal Shingles

Single-ply Membrane Roofing

- Selvage (roll) roofing slope 2:12 or greater per NBC(AE):B:9.26.12.
- Smooth- or mineral-surface roll roofing slope 3:12 or greater per NBC(AE):B:9.26.12.
- PVC Sheet roofing per NBC(AE):B:9.26.16. and CAN/CGSB-37.54 and CGSB 37-GP-55M
- EPDM Sheet roofing per NBC(AE):B:9.26.2.1.(2) and ASTM D 4637/D 4637M
- TPO-based Sheet roofing per NBC(AE):B:9.26.2.1.(2) and ASTM D 6878/D 6878M

Built-Up Roofing per NBC(AE):B:9.26.11., see also 9.26.2.1.(2) and 9.26.3.1.(1)

Glass Reinforced Polyester Roofing panels per NBC(AE):B:9.26.14.; where not supported on roof sheathing, provide a CCMC evaluation report or site-specific engineer-stamped design for review.

Roof Tiles or slates

- Concrete Roof Tiles per NBC(AE):B:9.26.17. and CAN/CSA-A220 Series, "Concrete Roof Tiles"
- Slate shingles or clay tiles of slope 6:12 or greater, only per manufacturer specifications

Other Innovative roofing systems may be proposed, with a CCMC evaluation report or site-specific design by a registered professional competent in building envelope design for review.

Cladding

Cladding of the exterior, which includes the wall covering, flashing and soffit, is intended to deflect snow and rain and allow drainage/dissipation of any moisture that does get behind it; protect the wall assembly from mechanical damage and ultraviolet (UV) deterioration; and be reasonably durable.
The following are Code-listed options for exterior cladding for a detached parking structure. Each type of finish requires specific supporting materials, wall assembly sheathing protection, fasteners, trim, sealants, and so on. See NBC(AE):B:9.27.

Vinyl siding per NBC(AE):B:9.27.12. and CAN/CGSB-41.24

Metal Siding per NBC(AE):B:9.27.11.;

- Horizontal or vertical strip **steel** siding, including flashing and trim accessories, per NBC(AE):B:9.27.11. and CAN/CGSB-93.4; and/or **steel sheet** cladding min 0.3 mm thick, per NBC(AE):B:9.27.11. and CAN/CGSB-93.3-M
- Horizontal or vertical strip **aluminum** siding, including flashing and trim accessories, per NBC(AE):B:9.27.11. and CAN/CGSB-93.2-M; and/or **aluminium sheet** cladding min 0.46mm thick per NBC(AE):B:9.27.11. and CAN/CGSB-93.1-M, except 0.58mm min aluminium sheet thickness if no sheathing/backing under sheets.

Fibre-Cement siding; Plywood siding NBC(AE):B:9.27.8.; Hardboard siding NBC(AE):B: 9.27.9.; OSB and Waferboard siding NBC(AE):B:9.27.10.

Lumber siding per NBC(AE):B:9.27.6.

Wood shingle and shakes per NBC(AE):B:9.27.7.

Cement stucco per NBC(AE):B:9.28 and 9.27.5.1.(2) minimum 2 base coats + 1 finish coat for total minimum 15mm thickness measured from face of lath or face of masonry without lath. Keep stucco at least 200mm above finished ground unless it is applied over concrete/masonry.

EIFS exterior insulation finish system NBC(AE):B:9.27.13. There are **three** compliance paths:

- **Prescriptive** method per NBC(AE):B:9.27.1.1.(5) complying with
  - 9.25.5. Properties and Position of Materials in the Building Envelope,
  - 9.27.2. Required Protection from Precipitation,
  - 9.27.3. Second Plane of Protection,
  - 9.27.4. Sealants,
  - 9.27.13. Exterior Insulation Finish Systems, which stipulates conformance of
    - materials to CAN/ULC-S716.1, “Exterior Insulation and Finish Systems (EIFS) - Materials and Systems,”
    - design to CAN/ULC-S716.3, “Exterior Insulation and Finish System (EIFS) - Design Application,” and
    - installation to CAN/ULC-S716.2, “Exterior Insulation and Finish Systems (EIFS) - Installation of EIFS Components and Water Resistive Barrier”;
- **Design** by registered professional competent in building envelope design with assemblies and door, window and penetration details demonstrating compliance with
  - 5.1.4. Resistance to Loads and Deterioration,
  - 5.3 Heat Transfer,
  - 5.4 Air Leakage,
  - 5.5 Vapour Diffusion,
  - 5.6 Precipitation, and
  - CAN/ULC-S716.1, “Exterior Insulation and Finish Systems (EIFS) - Materials and Systems,” where covered in the scope of that standard and submitted with this permit application; or

- **CCMC**-evaluated system, and CCMC report submitted with this permit application.

Adhered Masonry veneer--mortar-backed artificial stone and thin brick per NBC(AE):B:9.20.6.6. There are **three** compliance paths:

- **Installation Materials, Methods and Limitations** published by Alberta Masonry Council per Standata 19-BCV-018R1;
- **Design** by registered professional competent in building envelope design, per NBC(AE):B:9.27.1.1.(6) with assemblies and door, window and penetration details demonstrating compliance with Part 5 submitted with this permit application; or
- **CCMC**-evaluated system, and CCMC report submitted with this permit application.

Brick, masonry or natural stone per NBC(AE):B:9.20., 9.27.2.,3.,4.; details submitted with this permit application.

Other Innovative cladding systems may be proposed, with a CCMC evaluation report or site-specific design by a registered professional competent in building envelope design for review.

Interior

Mandatory fire rating

The required minimum 45-minute fire-resistance rating is typically provided by applying a layer of 15.9mm (⅝") Type X gypsum wallboard to the inside face of the sidewalls **and** any gable end above the sidewall. This is required for any wall, measured from the exterior face, other than facing a street or public lane, constructed:

- Closer than 0.6m (23") to a property line that faces an adjoining property;
- Closer than 1.2m (47") to a property line that faces an adjoining property where the property is located outside the 10-minute fire response area (see Section 3, above); or
- At or near the property line on the zero side and closer than 1.2m on the easement side to a property line on a zero or reduced lot line property.

See also Section 3-Function for covered parking structures serving a Semi-detached or Row House. Tenant-to-tenant fire-rated separation may be required, as well as rating of any wall facing other buildings as set out in NBC(AE):B:9.10.14.

Lighting outlets and wall receptacles

A lighting outlet with fixture must be provided for a detached garage or carport. Where the fixture is ceiling-mounted above an area normally occupied by a parked car, it must be controlled by a wall switch near the doorway; otherwise, a switched lampholder (pull chain-type) may be used. Where the carport is illuminated by a light at the entrance to its associated dwelling unit, additional carport lighting is optional. See NBC(AE):B:9.34.2. An electrical permit is required; see Section 2 "Trade Permits", above.

Optional interior finishing

Interior finishes are not generally required in a detached parking structure facing a single detached house, except for required fire rating materials for locations listed above. Additional fire rating materials may be required in a multi-tenant garage at compartments between tenants and on any wall facing another building.

Energy efficiency

Occasional or seasonal heating (or cooling) of a garage requires that where heat generated from a fuel source is produced, then the building is to be insulated to at least the levels required in NBC(AE):B:9.25.

Plumbing and/or Heating

Installation of natural gas or propane-fired heating in the detached garage requires a gas permit. Running water and drain installation requires a plumbing permit. See Section 2 “Trade Permits”, above.

Section 8 Inspections

All permits require inspection; this applies to trade permit work as well as building permits. For a detached garage or carport, a single final building inspection is required **after** any trade inspections are completed. The building inspection is intended to review work performed before walls and ceilings are covered up (except mandatory fire ratings must be installed), and the building is put into use. The building inspector should be able to see many of the elements discussed in this guide: wall and roof framing, including roof truss bracing, lintel placement, nailing and support, door and window location, eave (roof overhang) soffit treatment, cladding installation, any required fire rating gypsum, and so on.

Typically, a single building inspection is included in the HIP permit, and extra inspection fees may be incurred if return visits for inspection must be made due to unaddressed, inaccessible or unsafe location, plans not on site for the inspector, work is incomplete or with continuing infractions. Read more about inspections here.

Sometimes a plan changes as work progresses. Some minor changes to plans and specifications for an issued Building Permit may be made after construction begins without engaging in the Permit Revision process. Review the Part 9 Project Product Swap and Plan Revision Procedure for details. If still with concerns, contact ResidentialBuildingPermit@edmonton.ca with the permit number and question. Ensure the requirements of the permit and plans and specifications for the permit are met before requesting inspection, to avoid an infraction for not building according to plan.

Remember the general rule that work intended to be covered must first be inspected. Standard inspections can be requested under the 'INSPECTIONS' heading on the project dashboard at SelfServe.edmonton.ca, or by calling 311 (outside Edmonton, call 780-442-5311)