



Uncovered Deck Design Guide

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Section 1 Introduction

This guide provides information to support you in obtaining permits to construct an uncovered deck intended to serve a single dwelling unit in Edmonton, by providing some planning and building code requirements for your consideration. The text and diagrams illustrate principles; other methods of satisfying the requirements may be equally valid. National Building Code (Alberta Edition) requirements govern. Obtain a free copy of the NBC(AE) and of the Illustrated User's Guide-NBC2015 from [Codes Canada Publications here](#).

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.
- Underground utilities may have decks over them so long as the lines themselves are not put at risk. Check with ATCO about decks over gas lines supplying your gas meter which must be accessible for maintenance/replacement. A deck should be vented on at least two sides if it is over any gas line.
- Consider future plans or projects when planning where the deck is constructed so changes are not needed at a later stage of development.
- Overhead clearance of at least 3.5m (11' 6") above the deck walking surface to electrical wires is required.
- Construction must be resistant to deterioration due to exposure to the elements and climatic conditions, through factory-applied treatments or suitable site-applied coatings or stains. Read about handling treated lumber [here](#) and [here](#).
- Use fasteners compatible with treated lumber or deck membranes.
- Promote drainage and drying in the assembled deck by proper ground and deck grading, providing appropriate drainage gaps between components, and ventilation--including untreated wood framing beneath waterproof membranes.
- Limit moisture exposure to the deck and supporting structure such as the ledger board by deflecting water away from wood elements with proper flashing.
- Reduce water damage risk by smart location of downspouts, planters and ventilation outlets for furnace, bathroom or dryer.
- Provide easy access for inspection, cleaning and maintenance.
- Retain appropriate help if you are not able to plan and/or construct this project.
- Follow National Building Code 2019 (Alberta Edition) when designing and building any structure. 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 (Alberta Edition) is referred to as 'NBC(AE)' or 'Code' in this guide. The National Building Code is the model (source) code for the Alberta Edition, and called 'NBC' in this guide. Refer to NBC(AE) 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 the NBC(AE).

Permit for a deck--when and why

For Home Improvement Projects in Edmonton, the development permit and building permit are combined into a single document. You may require a development permit, for example for a front yard deck, but no building permit because it is very low to the ground. Or, you may not require a development permit for a deck in the back yard, however a building permit is needed because it is more than 0.6m above the ground. In either case, you still must apply for and receive an Uncovered Deck Permit for the project before starting work.

Is Development Permit approval required?

A development permit is written approval issued by the City of Edmonton to ensure that your deck meets the Zoning Bylaw requirements. A development permit may or may not be required--depending on the proposed deck location, size and height.

An uncovered deck less than 1.2m (47 ¼") in height above the ground that is entirely located within a back yard or interior side yard does not require a development permit. However, a development permit is required if the deck is located in the front yard or flanking side yard.

An uncovered deck over 1.2m in height above the ground requires a development permit regardless of the location. A deck 1.8m (71") or over in height will be added towards the Site Coverage, which is the amount of property that is covered by all buildings and structures on the lot.

Is a Building Permit required?

A deck not greater than 0.6m in height above finished ground does not typically require a building permit. Deck height is measured vertically from the deck walking surface to the lowest adjacent ground level or surface.

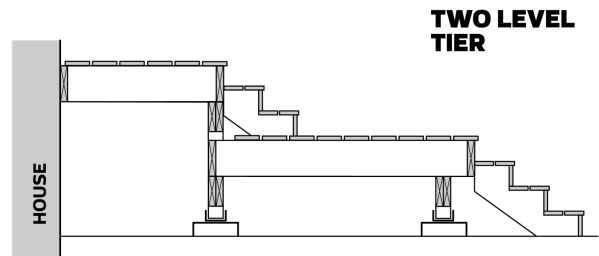
Occasionally, the adjacent surface within 1.2m of the deck walking surface drops more than 0.6m (1:2 slope) or is adjacent to a retaining wall to a surface more than 0.6m lower than the deck walking surface. A guard must be installed, and a building permit is required.

Where a permit is not required, one *may* be obtained optionally; work needs to comply with all minimum requirements, inspection will follow and a record of the work will be made.

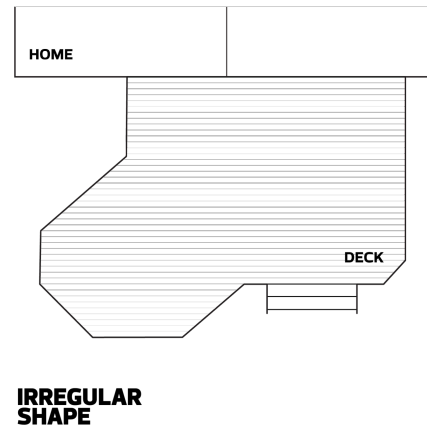
Drawings for a deck permit--when and why

- [Site plan](#) shows the entire existing property and the location of the proposed deck, and is required if the property is located on the [top of a bank](#), the house is a [designated heritage building](#), and/or the proposed deck is 1.8m or higher.

- **Multi-level** deck proposals often have more complex beam arrangements than a single level deck, so plan and section drawings adequate to communicate the construction plan are needed for the permit issuer to be able to check it complies with Code.



- **Irregular-shape** deck proposals, including decks with irregularities or openings in the deck walking surface involving joist header and trimmer placement, often have more complex beam and joist arrangements than a rectangular deck. We need to see drawings that show the necessary doubling or tripling of header joists, etc. An exception to drawing requirements is for the reduction of a cantilever at a platform corner by cutting a joist(s) back at an angle for appearance or to remove a sharp corner adjacent to a sidewalk; do not cut back further than the outward face of the beam that supports the joists.



- **Large deck** proposal, exceeding Deck Length of 18', requires drawings as it will likely be supported on more than one beam or the supported joist span will exceed 4.9m. Both these conditions require plan review.
- **Large deck** proposal, exceeding Deck Width of 30' requires drawings for plan review.
- **Large deck** proposal, exceeding 55 sq m (592 sq ft) in area, as engineer-stamped design is required for any foundation type, and plan review is required.
- **Large loads** proposed to be supported on the deck, including but not limited to
 - hot tub or pool; (Note setting the hot tub on the ground does not require engineer review unless specified by the hot tub manufacturer. All service points on the hot tub must be accessible if the deck is built around it. [Read more about hot tub permit requirements here.](#))
 - built-in fireplace or large barbecue;
 - roof over the deck; (Note awnings and shade sails supported independent of the deck structure and intended to be retracted in inclement weather and in winter are not included.)
 - gazebo or accessory structure.

All these sorts of unusual and special proposals require plan review, for which plans are required.

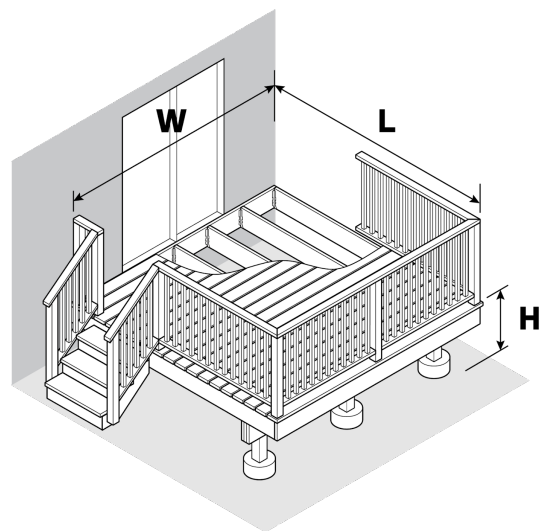
- **Unconventional materials** for joists, beam or columns of engineered wood (e.g., I-joists, LVL, etc.,) steel, masonry or concrete require plan review.
- **Deck Height greater than 1.8m** (71") requires engineer-stamped foundation design submitted with the permit application, and review of that plan.
- **Deck Height greater than 3.6m** (142") requires an engineer-stamped design for all components of the entire deck submitted with the permit application for review.
- **Decks located on or near "top-of-bank"** sites may require engineer-stamped design to account for potential slope instability, depending on conditions listed in the associated house geotechnical report.
- **Use not typical** of a single dwelling unit, such as a home-based business client gathering area or a process-equipment work area. Plan review is required to verify the platform loading is accounted for in the design.

Deck Design

Span and spacing of joists and beams used to frame a deck listed in this guide and associated permit application refer to a deck framed of dimensional lumber. 'Nominal' lumber dimensions in Imperial units are used for clarity. For example, a 2"x4" measures 1½" x 3½" at time of sale. Where metric units are used for alignment with Code requirements, an acceptable equivalent imperial dimension is provided. Listed imperial dimensions alone are considered acceptable for purposes of this application.

Factory-applied preservative treatment of framing lumber marginally impacts allowable spans, as seen in the [Prescriptive Residential Exterior Wood Deck Span Guide](#) © 2016 Canadian Wood Council. Suggested acceptable spans for typical deck permits in this guide and associated permit application are based on Spruce-Pine-Fir #2 and better lumber treated in a factory, and are acceptable for untreated lumber as well.

Deck Height (H) Above Grade means the greatest vertical distance between the deck walking surface and lowest adjacent finished ground level. This is **H** on the sketch below, and is important as certain design requirements are based on the height of the deck.



Deck Length (L) is measured at a right angle to / projecting from the house wall that has the deck ledger board, and is a main factor in choosing a joist size. See **L** on the sketch

below. If planning a 'floating' freestanding deck, the dimension for length **L** aligns with the joist direction.

Deck Width (W) is measured parallel to the house. For a simple deck plan, the deck width will be the same as the deck beam length. See **W** on the sketch below. If planning a freestanding 'floating' deck, which is not connected to the house or appropriate stable accessory building, the dimension for width **W** is taken at a right angle to the deck joists.

A building permit is required for a **deck higher than 600mm** above adjacent ground.

Where the proposed **deck height is greater than 1.8m** (71") up to and including 3.6m (142"), submit engineer-stamped design for the foundation and foundation-to-post connection, and a [CCMC Evaluation Report](#) (listing product uses and limitations), testing reports (e.g., Intertek), or Alberta-engineer-stamped drawings or specifications demonstrating Code compliance for any manufactured guards of metal, vinyl and/or glass used on the deck.

For a **deck greater than 3.6m in height** (142"), we require site-specific engineer-stamped design for the entire deck, including but not limited to foundation, columns, beam(s), joists, guards, stringers, bracing and all connections such as deck ledger board to house frame, joists to ledger, joists to beam, beam to posts, posts to foundation, and so on.

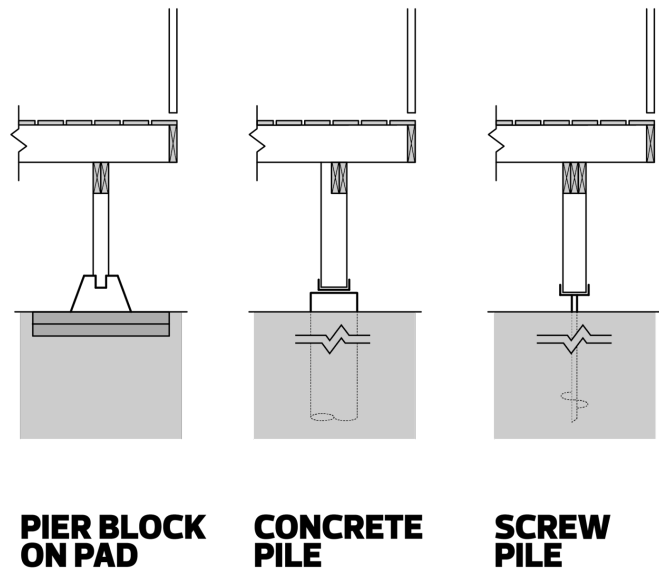
For **any deck supporting heavy loads** such as a hot tub, fireplace, roof, gazebo or other extraordinary load, submit engineer-stamped design for the deck and connections, as listed above for the high deck.

Section 2 Framing and Supporting Elements

Foundation

Foundations are to extend down to undisturbed soil, and below frost level--at least 1.2 m (4') below grade is typical in Edmonton, but dependent on soil conditions. See NBC(AE):B:9.12.2. for additional detail.

Piles of concrete or metal (helical piles, torque piles or screw piles) are not defined in NBC(AE), so require design by an engineering professional. For a deck of height above 1.8m (71"), this design is to be submitted with the application.



Piers under decks are typically concrete pad footings placed below frost level and below the level of earth disturbed from previous excavation. The pad footing supports an integral minimum 190mm x 190mm (8" x 8") concrete column rising up to at least 150mm (6") above the finished ground level. These are not commonly used today.

Experience in Edmonton has shown that minor settling and seasonal differential movement will not adversely affect the house rim board or house wall if the deck frame is connected to a well-installed ledger board, and deck posts are seated on a base that is reasonably firm and well drained. **Pier blocks on pads** of concrete on well-drained, undisturbed or compacted rock or coarse-grained soil free of organic material have proved generally adequate in Edmonton for supporting attached or freestanding decks near ground level. There must be tolerance for seasonal movement or ground settlement, and a way to access the posts to adjust the level from time to time as needed due to possible movement. Typical pads are 2' x 2' or greater, of at least 4" thickness.

Where a deck is supported on pads on a base of other than coarse-grained soil with good drainage or rock, access to the foundation positions to permit re-leveling of the platform must be provided by either a minimum 2' x 2' accessway to under the deck (where joist bottoms are at least 2' above the ground), or by installing some removable decking in order to be able to safely make adjustments.

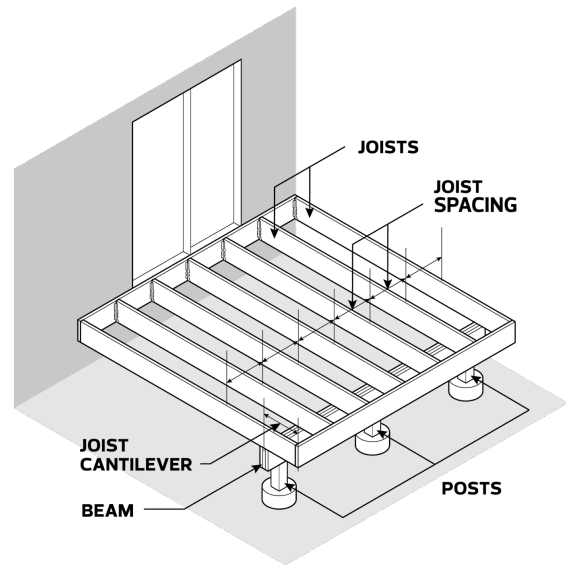
If you have a future plan to obtain permits to enclose the deck at a later date to create a sunroom or addition, consider a permanent foundation; engineering of any of the foundations listed above will eventually be required if the deck is to support walls and a

roof, regardless of deck height. Submit the design with the deck permit application, but also retain a copy for future reference, as the City is not obligated to retain drawings and documents in perpetuity.

Posts

Wood posts supporting a deck beam must be 6" x 6" (truly measuring about 5½" x 5½") or at least 7¼" diameter in cross section, unless supporting a 2-ply beam for a deck not more than 1.8m (71") high in which case a 4" x 4" post may be used. Other post materials, such as iron columns, are to have product specifications including connection details included in the permit application.

Where a wood post is not a solid sawn timber, it may be built-up of minimum 1½"-thick full-length lumber pieces nailed together with 2 rows of minimum 3" nails spaced no more than 12" apart. Alternatively, column members may be bolted together, using minimum ¾" diam bolts spaced no more than 18" apart.



Framing 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, or other appropriate solutions such as metal post bases, saddle anchors or neoprene spacers.

Posts are to be centred on the supporting foundation pile, pier or pad to effectively transfer load to the ground. The deck beam must be fully supported on the top of the post, and securely fastened to the post to reduce the likelihood of lateral movement between the post and beam.

All framing members must be framed, fastened, anchored and braced to provide strength and rigidity. Ground anchorage is not required in Code for uncovered single-level decks up to 55 sq m (592 sq ft) in area, but highly recommended.

Lateral bracing of columns, to resist racking effect, in addition to that provided by ledger-joist and post-beam connections should be considered. Diagonal members stretching from corner posts to the deck frame are typically adequate, if robust deck skirting does not provide the support. Note that a deck over 3.6m high will require engineered bracing design. No specific lateral support to columns is required if the

distance from finished ground to the underside of the floor frame joists is not more than 600mm (24")

Beams

A beam supports one end of the deck floor frame at or near the ends of the floor joists. The beam itself is supported by bearing on at least two posts (or other means of support) under it. Beams may also be derived from tables in NBC(AE) or in the [Span Book](#) if something other than the acceptable solutions found in the application is desired.

A beam is typically composed of 2 or more plies of lumber, but may be a single-ply beam in limited circumstances. A beam may **not** be side-connected to a post only by bolts, nails or screws; rather it bears on top of posts that are at least as wide as the beam itself. A beam may not generally be connected to the side of another beam or supported on another beam without engineer design.

Beam selection (the size and number of plies of lumber) is determined by a combination of post spacing, the span of the supported joists, wood species selected, and any factory-applied wood treatments.

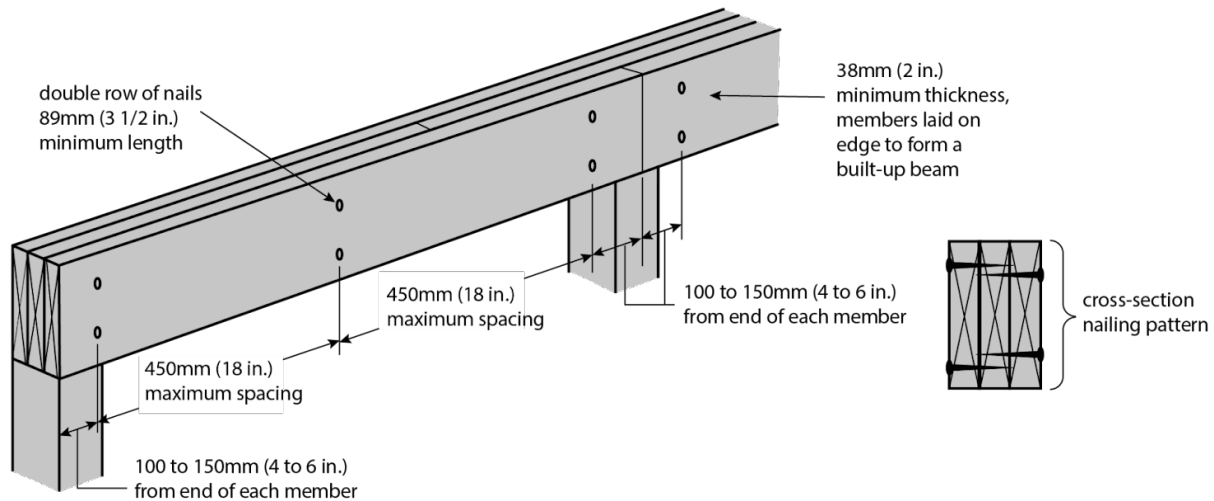
Floor joists may be supported on the top of or framed into the side of a beam. A **drop beam** is the more common type of deck beam installation. Located under the joists, the beam allows the floor joist frame to sit on the beam and 'cantilever' or extend beyond the beam a limited amount. Setting the beam back a bit from the deck edge serves to conceal it, its supporting posts and the foundation somewhat, which is a look many people prefer. Position the beam such that neither the allowable joist cantilever nor the maximum acceptable joist span is exceeded (as measured from the centre of beam for this application).

A **flush beam**--where floor joist framing is fastened into one side of the beam--requires that the beam material be at least the same depth as the joists, and the use of acceptable metal joist hangers (e.g., [Simpson](#) or similar) and the specific fasteners (nails, etc) indicated by the hanger manufacturer.

If hangers are not available, a beam deeper than the joists may be planned, with joists supported on a 2" x 3" ledger strip nailed to the side of the beam with two 3 ¼" nails per joist. Or, a ledger strip of 2" x 2" material may be used provided each joist is nailed to the beam by not less than four 3 ½" nails, in addition to the nailing required for the ledger strip.

In this guide and associated application, deck width corresponds to the required beam length. If the beam material is not long enough, pieces must be joined together in a specific fashion to be acceptable. A 2-ply or 3-ply beam is built by properly fastening the

members together. If using nails, two rows of 3½" nails spaced no more than 18" apart,



as well as within 4-6" from the end of each piece is adequate. Alternatively, beam members may be bolted together, using minimum ½" diameter bolts/washers spaced no more than 4' apart, ensuring bolts are also located within 2' from the ends of the beam.

A single joint, if needed, in a 3-post 2-ply beam must occur over the middle post. If, due to material limitations, a joint cannot be situated over the middle post, consider using a 3-ply beam of lumber built up as shown in NBC(AE):B:9.23.8.3. A single joint in a 3-post 3-ply beam may occur per span, made at or near a ¼ point from the middle post.

NBC(AE) provides no direction for a 'split' beam where members are connected to the sides of a post, so do not do this without submitting an engineering detail, or fully supporting the beam members with blocking to the foundation at the posts and blocking between the two members with nailing pattern similar to that for beam assembly above.

Beam cantilever is not prescribed in NBC(AE), and so relies on engineering. A rule of thumb that has generally proved adequate in Edmonton is that a beam not extend more than 1½ times its depth past the centre of the supporting post: 9" in the case of a 6" beam; 12" in the case of 8" beam; 15" in the case of a 10" beam; and 18" in the case of a 12" beam.

Beams have been discussed above, however a deck floor joist frame requires support at its opposite side as well. Typically, a **ledger board** fastened to the house wall (or other stable accessory building wall) supports the other end of the deck floor joist frame. NBC(AE) does not provide specific directions on ledger board fastening. Consider sources such as the [International Residential Code](#) (an international model building code) for best practice guidance for ledger board installation if your house does not have one installed by the house builder.

Do not plan a deck where the house floor is in cantilever (overhanging the foundation wall) without an engineer-stamped design, except if the house has a ledger installed by the original house builder, as marked on an engineered floor layout used to guide that original construction.

If there is no deck ledger provided or planned, each end of a low deck may be supported on any of the acceptable beams selected in the application. Such a fully-floating deck will require more attention to initial and periodic levelling as one side is not connected and levelled on a stationary building. If planning this adjacent to a building with spread footings and/or weeping tile foundation drain system, ensure piles are planned and located accordingly to not interfere with those elements.

Occasionally, a deck may be planned to extend past the limit of a ledger installed on a wall. Shallow foundation supporting an extension of the deck ledger is not recommended in such a case, as significant movement may occur along the edge of the deck aligned with the ledger portion as well as along the opposing deck edge. Extension of the ledger or engineer design for this uncommon proposal is recommended.

Joists

Joists are lengths of lumber arranged no greater than 600mm (24") to support the decking or walking surface. Joist selection is based on a balance of factors:

Span--distance a joist will safely support design floor loads between supports, which in this form is measured from mid-support.

Spacing of joist--typically spaced 16" apart (OC) but may be restricted by the spacing needed to support the desired decking.

Species & Grade of wood--Spruce-Pine-Fir #1, common lumber used in Edmonton, with factory preservative treatment, is listed in this application.

Cantilever--joist extension beyond the support, which in this application is measured from the centreline of the beam.

The application is based approximately on current common product availability. 2" x 4" and 2" x 6" acceptable span values are aligned with non-incised "smooth" or "weather" wood factory-applied treatment. 2" x 8" and larger are aligned with pressure-treated "incised" values.

Spans listed on the application are from the [Prescriptive Residential Exterior Wood Deck Span Guide](#) © 2016 Canadian Wood Council (Spruce-Pine-Fir #1) for factory-treated lumber. Span Tables in NBC(AE) or [Canadian Wood Council Span Book](#) may also be used for lumber not treated in a preservative-treatment factory, for other species such as Cedar, or if you prefer to draw and specify the lumber and beams to be used in the deck construction.

There will often be a number of acceptable combinations of joist size and spacing for a given deck length. Minimum 2" x 8" joists are recommended where wood side-mount guards are planned, to provide an adequate vertical connection surface of the guard posts.

Laying decking at an angle involves shifting joists closer together or selecting a joist with spacing that accommodates the actual maximum permissible unsupported length of decking, measured along the board.

Most often, an accessory such as a hot tub will be supported directly on the ground and a deck will be constructed around it. Any deck supporting a hot tub or other sort of extraordinary load requires engineer-stamped design for joists, beam, posts and foundation, and all connections including ledger board connection to a house wall. If in doubt, inquire through BuildingSafetyCodes@edmonton.ca

Section 3 Decking Material

The selected deck walking surface influences the deck floor frame construction, as walking surface materials have different tolerances.

Lumber less than 1½" thick (e.g., 5/4" x 6", etc.) may be supported on joists spaced up to 16" apart.

Lumber 1½" thick (e.g., 2"x4", 2"x6") may be supported on joists spaced up to 24" apart.

Manufactured decking made of composite materials, PVC, fibre-reinforced materials, liquid membrane coatings, sheet goods or similar products are becoming more popular.

Obtain documentation from the material supplier--a [CCMC Evaluation Report](#) (listing product uses and limitations), testing reports, or Alberta-engineer-stamped drawings or specifications demonstrating Code compliance of the manufactured decking material or the complete manufactured deck system. Submit a copy with the application, and follow the joist spacing, floor construction and preparation steps specified by the manufacturer, CCMC Report, or engineer.

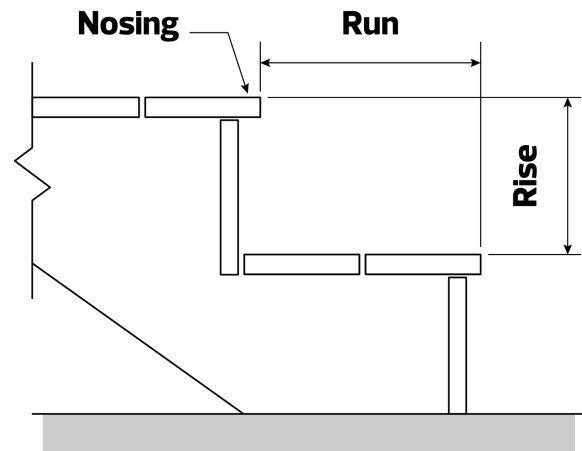
Section 4 Stairs, Guards and Handrails

Stairs

Stairs are typically built as a straight flight on a deck, however a curved flight or spiral stair may be desirable under certain conditions--to some very specific tolerances. Flight means a series of steps between landings, which includes between the deck and the ground. Stairs and any required guards and handrails are to comply with NBC(AE).

Stair Rise means the vertical distance between two adjacent treads on a stair, or between tread and landing. Any flight of stairs must be at least 860mm (34") wide, with all steps of uniform rise between 125mm and 200mm (5"-7- $\frac{7}{8}$ ").

Be particularly watchful of the height of the topmost rise as the stair reaches the deck, and the bottommost rise where the stair reaches the ground. A common error is to not compensate for tread thickness when laying out and connecting the stair stringers. This results in a non-uniform rise unacceptably different from the others.



To accommodate minor variations in construction, the rise may vary in height up to 5mm between adjacent treads and landings including the deck itself, but may not vary more than 10mm between the tallest and shortest risers in a flight.

Stair Run means the horizontal distance between two adjacent tread nosings on a stair. Most deck stairs are straight flights of rectangular treads which must measure between 255mm and 355mm (10"-14") in depth, with a nosing no more than an additional 1".

Exterior wood stairs, like other deck parts such as posts supporting the beam, are to be isolated from direct ground contact unless treated with a wood preservative. Stair stringers are to be 1 $\frac{1}{2}$ " thick. Stringer spacing up to 900mm (36") may be increased up to 1200mm (48") if riser boards support the front part of the treads. Stair stringers must be well-supported at the top and bottom. Properly-installed stringer hangers (e.g., [Simpson](#) or similar) or other connectors may prove more robust than nailing alone.

Stringers, after shaping, must have at least 90mm (3 $\frac{1}{2}$ ") minimum effective depth and at least 235mm (9 $\frac{1}{4}$ ") overall depth, as measured perpendicular to the bottom of the

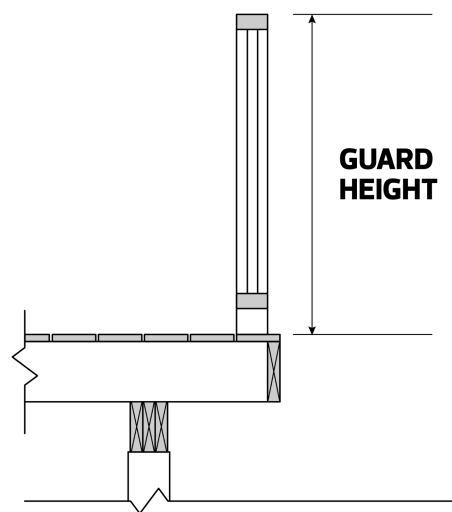
stringer. A common construction error is incorrect top step and bottom step rise, due to not accounting for tread thickness when laying out prior to shaping the stringer.

Tapered treads result in a curved stair, however they do take skillful work to achieve. Such tapered treads require a run of not less than 150mm (6") at the narrow end of the tread, and--when measured 300mm (12") from the centre line of the handrail at the narrow end of the tread--tread depth must uniformly measure between 255mm and 355mm (10"-14") and the acceptable uniform rise deviation no more than as listed above. Tread nosing may not be more than an additional 1".

Guards

Sides of a deck must be protected by a guard to mitigate fall hazards where the deck is

- not built against a wall that is at least as high as the required guard,
- more than 600mm (23") high,
- adjacent a surface within 1.2 m of the deck walking surface that is sloping away at a rate steeper than 1:2 (~30°), or
- adjacent a vertical drop within 1.2m that results in a total drop exceeding 600 mm, such as a walking surface above a retaining wall located less than 1.2m measured horizontally from the edge of the deck walking surface.



Guards must be at least 1.07m (42") high, measured from the deck surface to the top of the guard, but may be 0.9 m (36") high if the deck height is less than 1.8m (71"). A guard located higher than 4.2m above the finished ground can have no climbable elements, per NBC(AE):B:9.8.8.6.

Openings in deck guards must be small enough to prevent the passage of a 100 mm (4") diameter sphere. For a deck of height up to 600mm (24"), no guard is required but, if one is provided, the openings through the guard must be no more than 100mm or more than 200mm to prevent a child from accidentally getting stuck in the guard.

Provide necessary extra rim blocking where a wood guard post is side-mounted to the deck floor structure to ensure that the design loads are met as specified in NBC(AE). Minimum 2"x8" joist is recommended if wood side-mounted guards are proposed, for adequate vertical connection surface.

Guard posts of wood should be fastened with lag bolts or through bolts to ensure they are adequately supported. Examples of best practice details for wood guards are provided in Supplementary Standard SB-7 Guards for Housing and Small Buildings of the 2012 Ontario Building Code (Compendium).

Metal, vinyl and/or glass guard product design must demonstrate compliance with NBC(AE) or NBC2015, in the form of a [CCMC Evaluation Report](#) (listing product uses and limitations), testing reports (e.g., Intertek), or Alberta-engineer-stamped drawings or specifications demonstrating Code compliance for any manufactured guards of metal, vinyl and/or glass used on the deck. Follow the installation steps specified by the manufacturer, CCMC Report, or engineer.

Glass in guards must be factory-marked (etched) safety glass, laminated or tempered type that conforms with CAN/CGSB-12.1-M "Tempered or Laminated Safety Glass" or wired glass conforming to CAN/CGSB-12.11-M, "Wired Safety Glass."

Fixed benches around the deck perimeter meeting the requirements of guards, as measured **up** from the seating surface of the bench, and meeting the restrictions on guard openings below the seating may serve as a guard.

Handrails

When the deck requires guards, any side of a stair not against a wall also requires guards at least 900mm (36") high to top when measured vertically from the nosing of the step. Openings in the stair guards have the same restrictions as listed above for deck guards.

A handrail is required on at least one side of an exterior stair where there are more than 3 risers, and on both sides if the stair is wider than 1100mm, and no closer than 50mm (2") to any wall behind it, increased to 60mm where the wall surface behind is rough or abrasive. When not using a purpose-built manufactured handrail--for which its installation instructions are to be followed--attach a handrail firmly with brackets spaced no more than 1.2m (48") apart and no more than 300mm (12") from the ends of the handrail. Handrails must be smooth, graspable, and mounted 34"-42" above stairs, as measured vertically through nosing.

The handrail may be integrated into the top of the guard so long as it sits between 865mm (34") and 1070mm (42") above the stair, also measured vertically from the stair nosing, and is smooth and graspable. That may prove unreachable to some users, so additional handrail(s) lower than listed above are acceptable, so long as the Code-mandated handrail is also installed. Material up to 3 ½" is considered graspable.