Building Bulletin – 2026-005

Deck Guide

Date: May 8, 2026

This guide was created to supply the public with helpful information on the design and construction of wood decks and balconies. This is to be used only as a guide and does not represent all applications of these types of structures.

Elements of Wood Decks and Balconies

This Guide focuses on several components of these structures:

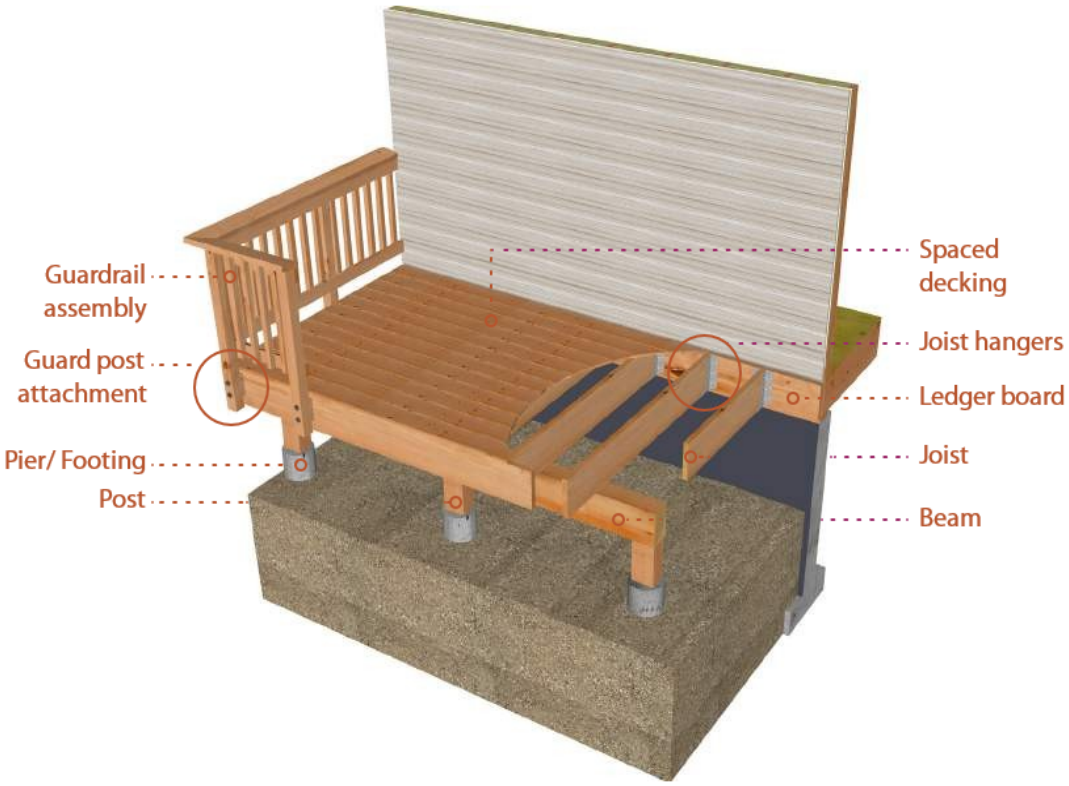
- Support structure
- Attachments
- Guardrails
- Stairs
- Walking surface

Factors that improve performance in the outdoor environment are also discussed. The diagrams and information below identify some common components of these structures.

There are three ways to commonly support wood decks and balconies:

1. Built as an independently supported structure, or is supported independently on posts, piers, and footings;
2. By structural members that extend through the building enclosure (cantilevered); or
3. One edge supported by a ledger attached to the building structure. The outside edge is supported independently on posts, piers, and footings.

Below will illustrate the different elements to be constructed to complete your project. Each element should receive careful consideration in the design stage.



Foundations

Footings and Foundations are required to comply with sections 9.12. and 9.15. of Division B of the National Building Code (NBC). Section 9.12. speaks to prescriptive depths of foundations relative to frost penetration, however the City of Whitehorse has an undetermined frost depth due to the different types of soil conditions and how they relate with our climate. Therefore, you may require a Geotechnical Engineer to determine the acceptable means of compliance with regards to footings and foundation for your project depending on the design you choose.

Columns

The requirements for concrete columns can be found in subsection 9.17.6. of Division B of the National Building Code. Columns made of unit masonry (cinder blocks) shall not be less than 290mm x 290mm if square or 240mm x 380mm if rectangular. Solid concrete columns are addressed in article 9.17.6.2. and have minimum dimensions of 200mm x 200mm when rectangular, or a 230mm diameter when circular. Other options, such as helical piles may be used when designed by a professional engineer.

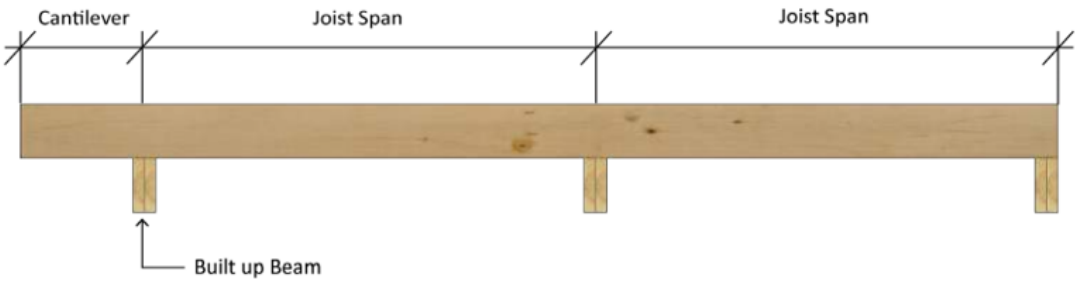
Left:
Helical pile foundation

Right:
Post connection to concrete foundation

Framing (Posts, Beams, and Joists)

Once the deck or balcony dimensions and design loads are determined, structural framing members can usually be selected from section 9.23. and the span tables in the National Building Code. Framing members are highly influenced by wood species, preservative treatment process (incising), service conditions, and joist spacing and dimensions. The following tables are reproduced from the Canadian Wood Council Prescriptive Residential Exterior Wood Deck Span Guide and can be used for incised (treated) wood products in wet service conditions. Note that wet service conditions and the use of pressure treated lumber will reduce allowable spans compared to untreated, protected framing members. As a result, untreated framing members in protected balconies will generally require different span tables.

Below will show the acceptable spans for the beams and floor joists as taken from the current addition of the NBC.



Allowable Joist Spans (meters)

Joist Size (mm)	300mm Joist Spacing				400mm Joist Spacing				600mm Joist Spacing				Maximum Allowable Cantilever (mm)
	DF-L	H-F	S-P-F	Nor	DF-L	H-F	S-P-F	Nor	DF-L	H-F	S-P-F	Nor	
38 x 89	2.01	2.01	1.91	1.73	1.82	1.82	1.74	1.57	1.51	1.58	1.52	1.32	200
38 x 140	3.05	3.16	3.01	2.66	2.64	2.77	2.73	2.30	2.15	2.26	2.34	1.88	400
38 x 184	3.71	3.89	3.95	3.23	3.21	3.37	3.49	2.80	2.62	2.75	2.85	2.28	400
38 x 235	4.53	4.75	4.92	3.95	3.92	4.12	4.26	3.42	3.20	3.36	3.48	2.79	600

Beam Selection Supporting Two Spans (meters)

Joist Span (m)	1.2m Post Spacing				1.8m Post Spacing			
	DF-L	H-F	S-P-F	Nor	DF-L	H-F	S-P-F	Nor
2.4	2-38 x 140	2-38 x 140	2-38 x 140	2-38 x 140	2-38 x 235	2-38 x 184	2-38 x 184	2-38 x 235
3.0	2-38 x 140	2-38 x 140	2-38 x 140	2-38 x 184	2-38 x 235	2-38 x 235	2-38 x 235	2-38 x 286
3.7	2-38 x 184	2-38 x 140	2-38 x 140	2-38 x 184	2-38 x 286	2-38 x 235	2-38 x 235	3-38 x 235
4.3	2-38 x 184	2-38 x 184	2-38 x 184	2-38 x 235	2-38 x 286	2-38 x 286	2-38 x 286	3-38 x 235

Joist spacing is limited to a maximum of 600mm (24”) or less for Part 9 buildings (NBC 9.23.1.1.). If the deck or balcony is designed for a Part 4 building, the joist spacing may exceed this value, however the design of the deck or balcony must be undertaken by a professional engineer.

Beam selection (sizing and number of plies) is influenced by several factors including post spacing, joist span, service conditions, wood treatment, and wood species and their characteristics. When joists are connected to a beam, they must either be supported by the top of the beam or be framed to the side of the beam. When framing to the side of a beam, joists must be secured to the beam with acceptable joist hangers / metal connectors or by ledger strips and fasteners as described in 9.23.9.2. of the NBC. Refer to the span tables in the NBC and CAN/CSA O86 “Engineering Design in Wood” for further guidance on the selection of wood framing members.

Ledgers

Please review the City of Whitehorse's Building Bulletin 2026-004 for more information on deck ledgers and associated fastening and flashing requirements.

Decking

Some exterior wood structures rely on spaced deck boards or decking for a walking surface. Joist spacing typically governs the minimum allowable thickness of decking: as joist spacing increases, decking thickness must also increase (NBC 9.30.3.1.). At 400mm (16") joist spacing decking must be 25mm (1") thick, whereas at 600mm (24") joist spacing decking must be 38mm (1.5") thick. It is recommended that decking be face-fastened to the joists with two fasteners at each end, located at 25% and 75% width to reduce end-splitting.

Guards

All decks/balconies that are higher than 600mm (24") above grade must be equipped with guards to mitigate fall hazards (NBC 9.8.8.3). To minimize the risk of children bypassing guardrail assemblies, all openings must be designed to prevent the passage of a 100mm (4") diameter sphere and must demonstrate that the opening in question is not hazardous (NBC 9.8.8.5).

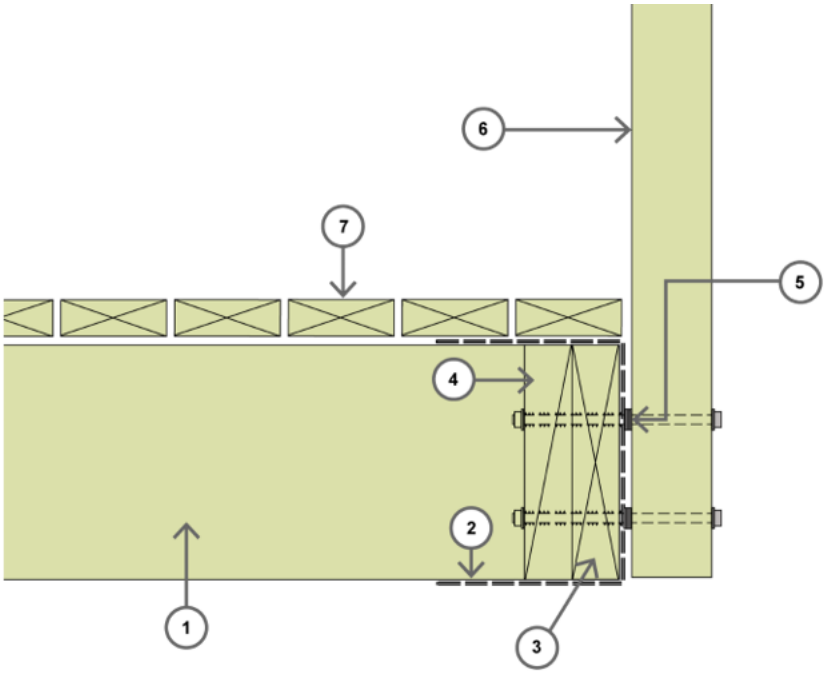
It is recommended that guard posts be fastened with lag bolts or through bolts to ensure they are adequately supported, though nails and screws are acceptable in some situations. Support blocking should also be provided where the guard post is side mounted to the deck structure (rim or floor joists) to ensure that the horizontal and vertical design loads are met as specified in the building code (NBC 9.8.8.2).

Guard posts should not be secured to the top surface of the deck or balcony because it is difficult to achieve adequate structural attachment and good drainage in this configuration. Where possible, a gap should be provided between the guard post and rim joist to facilitate drainage and drying.

To provide the required load resistance at the post-to-rim-joist connection, straps or other connectors are recommended to transfer loads placed on the guard back into the deck joist framing. If necessary, consult with a professional engineer to confirm that the guard configuration meets National Building Code requirements.

All guards are to be constructed according to 9.8.8. of the NBC when the difference between walking surface and the adjacent grade is greater than 600mm (24"). Guard heights shall be minimum of 900mm (36") where walking surface is greater than 600mm but not more than

1800mm. If the height from walking surface to grade is greater than 1800mm the guard must be 1070mm (42”).



Legend
1. Wood joists (p.t.)
2. Structural strap at each side of guard post
3. Rim joist (p.t.)
4. Blocking (p.t.)
5. Hot dipped galvanized washers at post locations
6. Guardrail system (p.t.)
7. Wood decking (p.t.)

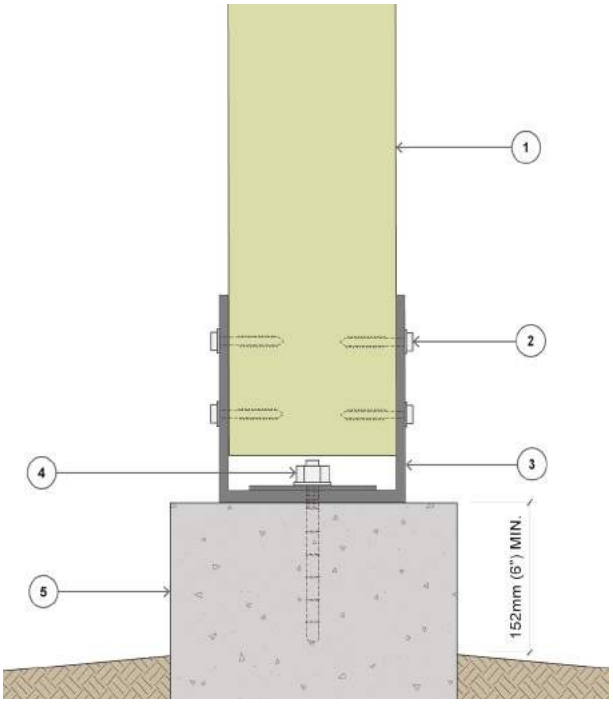
p.t. - pressure treated

Deck guard post attachment

Ventilation and Drying

It is critical that wood decks and balconies allow wood elements to dry once wet from rain or snow melt occurring. Many components are regularly exposed to moisture and will deteriorate if unable to dry out—even if they are naturally durable or treated with preservatives. Soffit panels should be vented when installed on the underside of a deck or balcony to allow for framing

members to dry. Situations should also be avoided where the end grain of wood elements is maintained in a wet environment where it is unable to readily drain and dry.

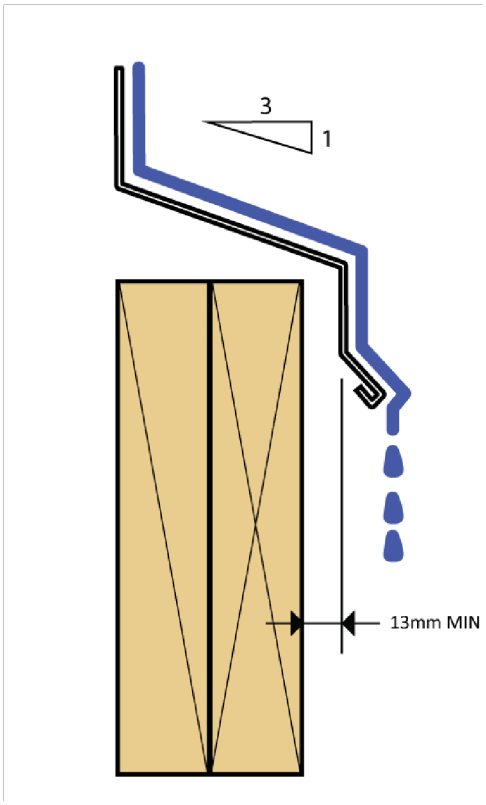


Legend
1. 140x140mm (5.5" x 5.5") Wood posts (p.t)
2. Hot dipped galvanized lag screws
3. Hot dipped galvanized standoff post base
4. Hot dipped galvanized anchor bolt
5. Concrete footing

p.t. - pressure treated

Metal Flashing Profiles

Flashing designs and profiles have a strong impact on the water-shedding characteristics and overall performance of flashing elements: the overhang distance, metal gauge, and profile angle all influence the effectiveness of the flashing. Ideally, a heavy gauge metal (24 gauge) should be selected to mitigate surface tension effects at the bottom leg of the flashing. A minimum 13mm (0.5”) gap is recommended between the flashing bottom leg and the vertical framing surface behind as well as a 45-degree drip edge to limit water kick-back and encourage drainage away from framing members.



Building Permit Requirements for Deck Construction

If a deck is new or is being rebuilt, a building permit is required if any of the following circumstances apply:

- A deck is part of the principal entrance into the dwelling
- A deck is more than two feet above grade
- A deck is covered with a roof
- A deck is attached to the dwelling

A checklist with all the application requirements can be found here.

Decks Considered Part of the Landscaping

If a deck is not physically connected to the dwelling, is not part of the principal entrance to the dwelling, is not more than two feet above grade, and is not covered with a roof, it is considered landscaping and no building permit is required. See Additional Considerations below.

Additional Circumstances When a Building Permit is Not Required

If a deck previously approved under a building permit requires only minor repairs or non-structural repairs, such as replacing the walking surface, a building permit is not required.

If a deck railing previously approved under a building permit needs to be replaced, a building permit is not required. See the Deck Addition Sample Plan for an example of a code-compliant railing. Additional information and options can be found in the current National Building Code available online.

Note: The current National Building Code is applicable to all structures built in the City of Whitehorse and the homeowner is responsible to ensure the railing meets the requirements of the code.

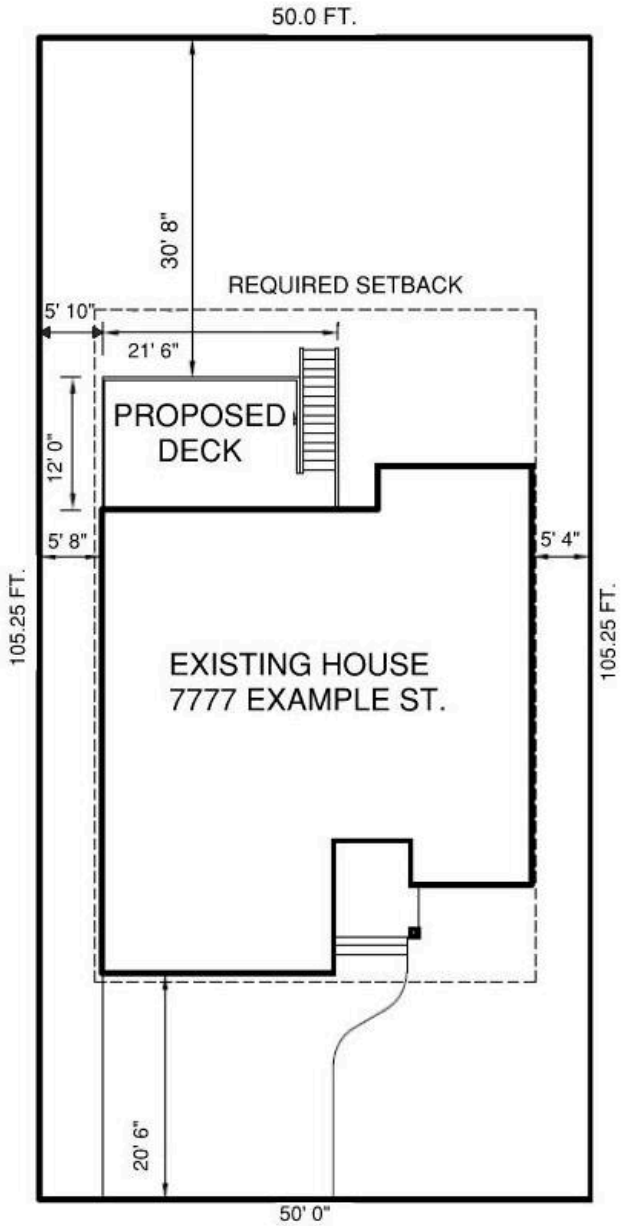
Additional Considerations

Restrictive covenants (registered on Title), utility right-of-ways, and distances to property lines, may affect the location of your deck, whether a building permit is required or not. Determining if any of these factors will affect the location of your deck is the responsibility of the homeowner.

If you have any specific questions or require clarification, please contact Building Services at inquirybuilding@whitehorse.ca.

Sample Plans

Deck Addition to a Single-Family Dwelling Site Plan



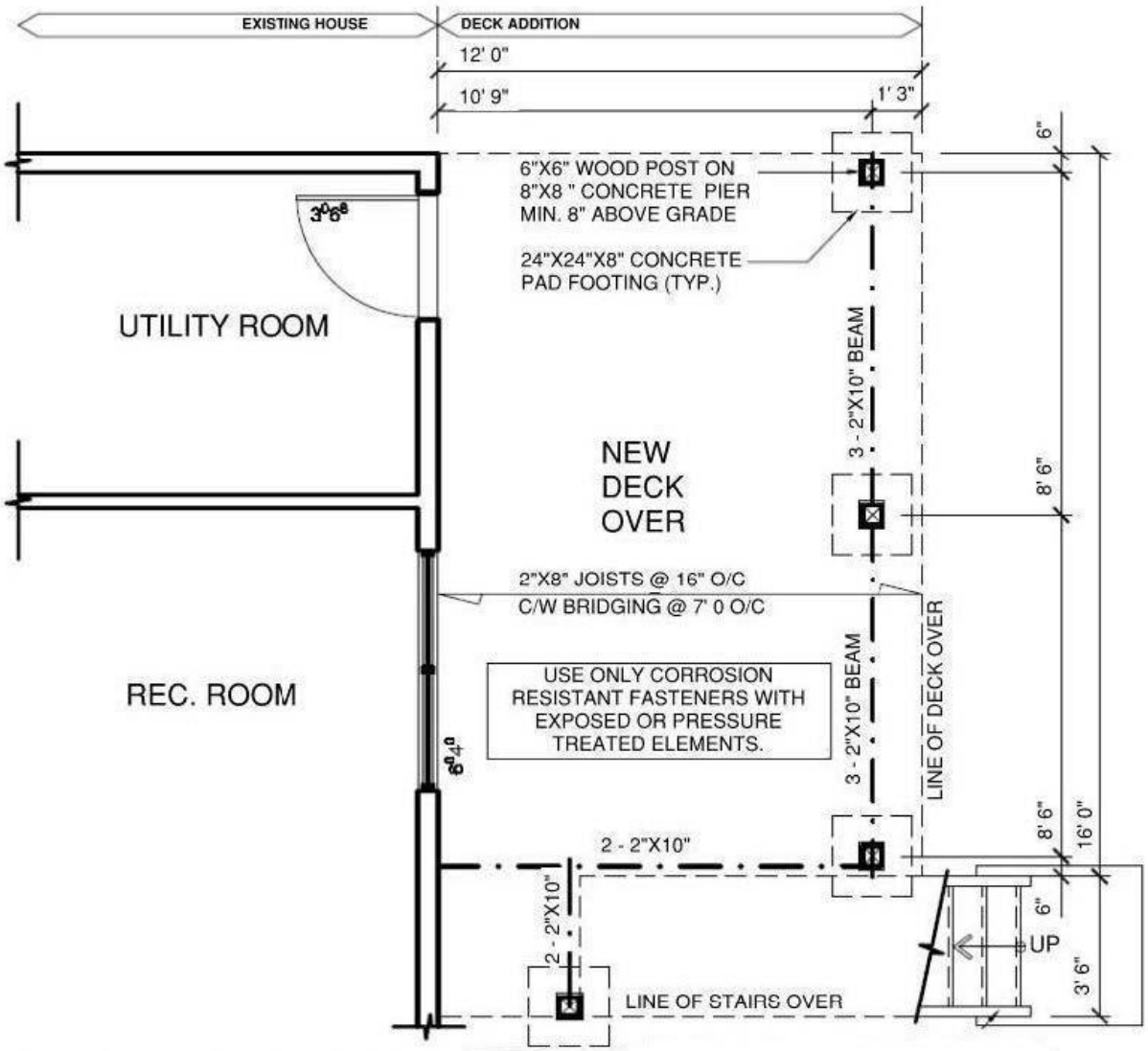
SITE PLAN

SCALE: 1/16" = 1'

**Note: Actual plans must be drawn on minimum 11" x 17" size paper. Plans must NOT be drawn on graph or lined paper.

Sample Plans

Deck Addition to a Single-Family Dwelling Foundation Plan



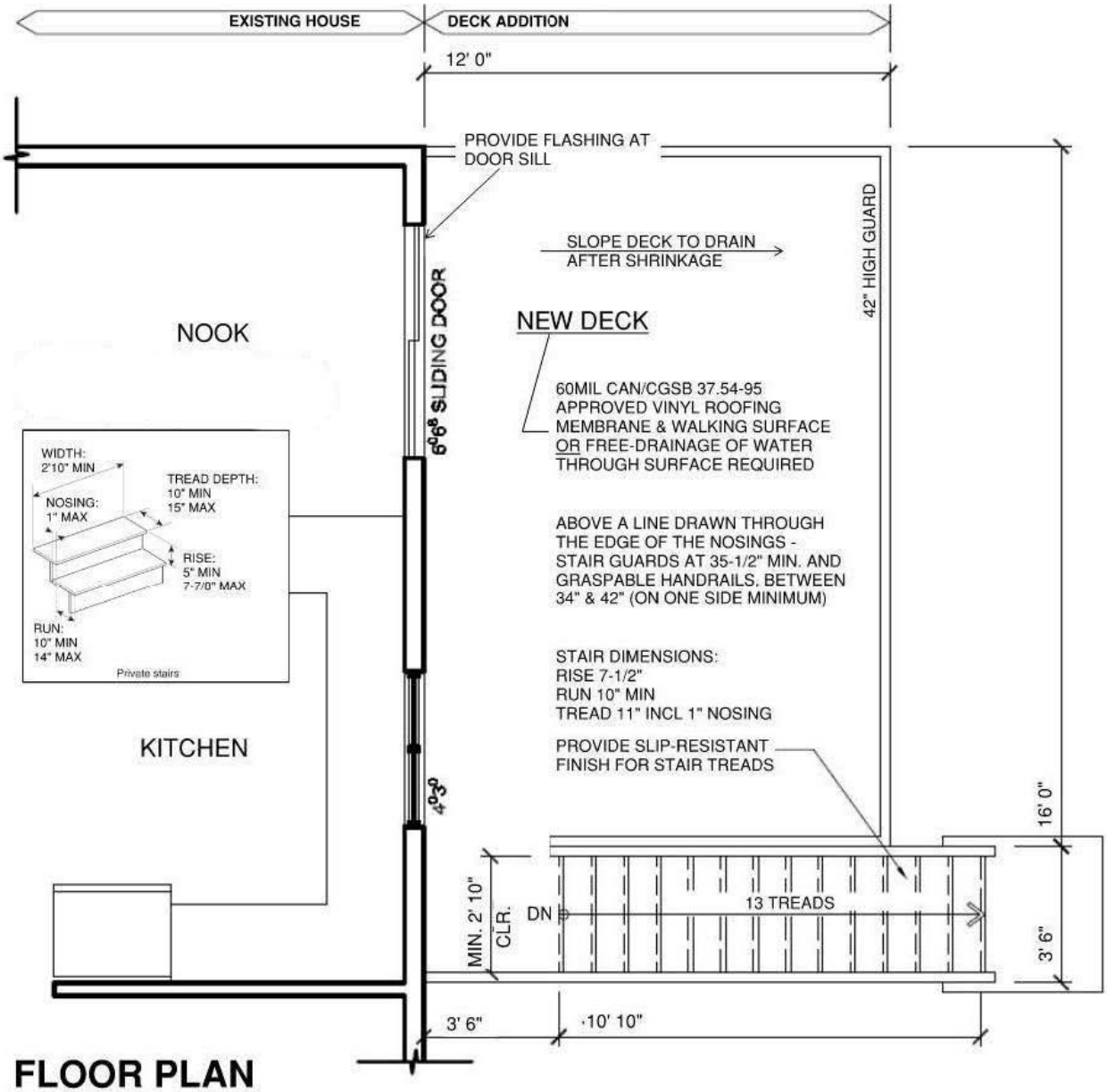
FOUNDATION PLAN

SCALE: 1/4" = 1'

**Note: Actural plans must be drawn on minimum 11"x 17" size paper. Plans must NOT be drawn on graph or lined paper.

Sample Plans

Deck Addition to a Single-Family Dwelling Floor Plan



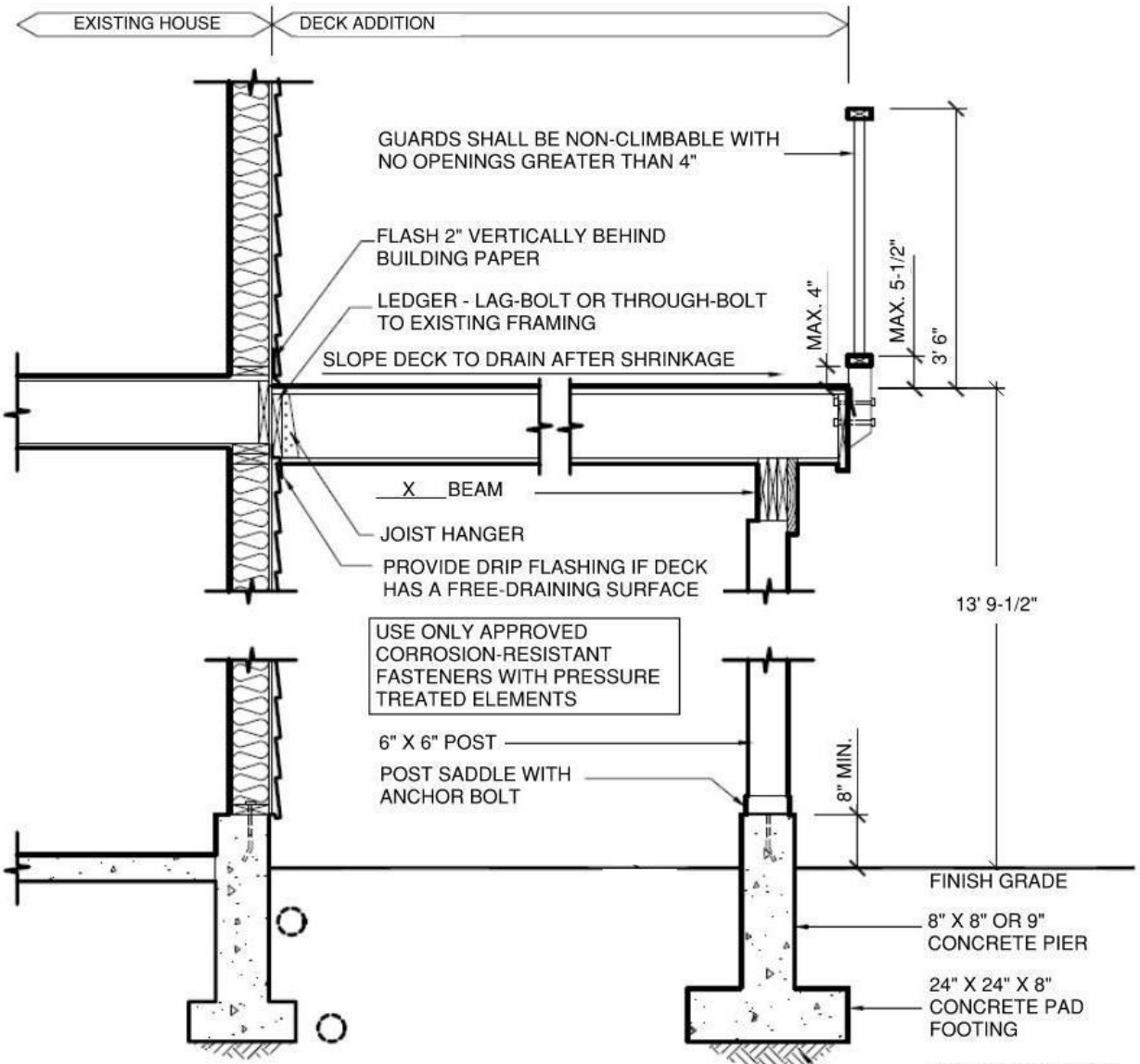
FLOOR PLAN

SCALE: 1/4" = 1'0"

**Note: Actual plans must be drawn on minimum 11x17" size paper. Plans must NOT be drawn on graph or lined paper.

Sample Plans

Deck Addition to a Single-Family Dwelling Cross Section



CROSS SECTION

SCALE: 1/2" = 1'0"

**Note: Actual plans must be drawn on minimum 11x17" size paper. Plans must NOT be drawn on graph or lined paper.