

What specifications need to be followed for a mono-slab system?

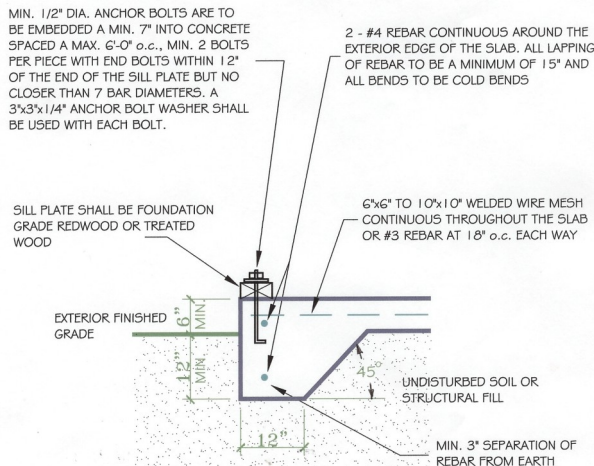
A mono-slab system may be constructed per the following drawings and specifications for detached garages and utility structures. A #3 reinforcing bar mat at 18" on center each direction may be substituted for the reinforcing mesh detailed in the drawing. Any further modifications will need to be designed by a Montana registered engineer.

REINFORCED THICKENED EDGE CONCRETE SLAB

(Mono-slab)

The use of a thickened edge slab as a foundation for a detached one-story residential accessory building shall be in accordance with the following design requirements:

- Ground shall be level.
- Slab shall be placed on undisturbed soil or approved structural fill.
- Slab **shall not be** used on organic soil, un-compacted fill, or **expansive soil**.
- Remove all sod and foreign matter under slab.
- Trench entire perimeter, including doorways.
- Slab shall not be used to support isolated columns, or 2nd story, unless engineered for that purpose.
- Slab shall not be used as a foundation system for structural additions to building with frost protected footings/unless prescriptive design from IRC figure R403.(3) is utilized.
- Maximum area of any slab for a one-story accessory building shall be 1,000 square feet.



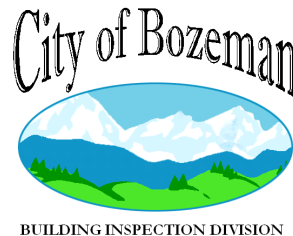
To Contact Us

Phone

406.582.2375

Fax

406.582.2256

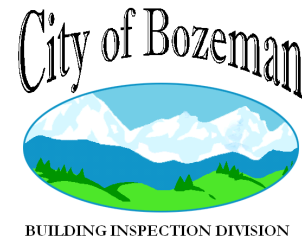


20 E Olive St., STE 208
PO Box 1230
Bozeman MT 59771

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Foundation and Footing Guidelines

Tips and Guidelines for frost heave protection



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PO Box 1230
Bozeman MT 59771
406.582.2375

Foundation and Footing depths for homes, patio's and decks. Mono-slab design for detached garages and utility structures...

What are the minimum foundation depths for buildings?

The minimum foundation depths for buildings constructed within the City of Bozeman jurisdictional area are as follows:

- Single story wood and metal structure foundations are to extend a minimum of 3 feet below finished grade to the bottom of the footings.
- Multi-story and masonry structure foundations are to extend a minimum of 4 feet below finished grade to the bottom of the footings.
- Footings and walls may be designed by the prescriptive design methods found in Chapter 4 of the International Residential Code or Chapter 18 of the International Building Code using the notes applicable to seismic zone D-1, or the City of Bozeman Prescriptive foundation Standards.
- Single story footings are to be a minimum of 12 inches in width and 6 inches in depth reinforced with a minimum of 2 - #4 reinforcing bars supported on undisturbed natural soil or engineered fill. Single story foundation walls are to be a minimum of 6 inches (8 inches if constructed of masonry) in thickness reinforced with a minimum of #4 reinforcing bars placed a minimum of 18 inches on center vertically and horizontally. The top bar is placed a maximum of 12" below the top of the wall. Concrete is to be a minimum of 2500 P.S.I. rated. Vertical reinforcing may be "wet set" into footings but shall maintain 3" clearance to soils. Footing projections shall be at least 2 inches minimum and shall not exceed the thickness of the footing between the edge of the footing and the edge of the foundation wall.
- Two story footings are to be a minimum of 15 inches in width and 8 inches in depth reinforced with a minimum of 2 - #4

reinforcing bars and supported on undisturbed natural soil or engineered fill. Two story foundation walls are to be a minimum of 8 inches in thickness reinforced with minimum #4 reinforcing bars placed 18 inches on center vertically and horizontally. The top horizontal bar is placed a maximum of 12" below the top of the wall. Concrete is to be a minimum of 2500 P.S.I. rated. Vertical reinforcing bars may be "wet set" into footings but shall maintain 3" clearance to soils. Footing projections shall be at least 2 inches minimum and shall not exceed the thickness of the footing between the edge of the footing and the edge of the foundation wall.

- Basement footings supporting a single story above are to be a minimum of 12 inches in width and 6 inches in depth reinforced with a minimum of 2 - #4 reinforcing bars supported on undisturbed natural soil or engineered fill. Foundation walls are to be a minimum of 6 inches (8 inches for masonry) in thickness reinforced with minimum #4 reinforcing bars placed 18 inches on center vertically and horizontally. The top horizontal bar is placed a maximum of 12" below the top of the wall. Concrete is to be a minimum of 2500 P.S.I. rated. Vertical reinforcing may be "wet set" into footings but shall maintain 3" clearance to soils. Footing projections shall be at least 2 inches minimum and shall not exceed the thickness of the footing between the edge of the footings and the edge of the foundation wall.
- Basement footings supporting two stories above are to be a minimum of 15 inches in width and 8 inches in depth reinforced with a minimum of 2 - #4 reinforcing bars supported on undisturbed natural soil or engineered fill. Foundation walls (2500 P.S.I. concrete) are to be a minimum of 8 inches in thickness reinforced with minimum

#4 reinforcing bars placed 18 inches on center vertically and horizontally. The top horizontal bar is placed a maximum of 12" below the top of the wall. Concrete is to be a minimum of 2500 P.S.I. rated. Vertical reinforcing bars may be "wet set" into footings but shall maintain 3" clearance to soils. Footing projections shall be at least 2 inches minimum and shall not exceed the thickness of the footing between the edge of the footing and the edge of the foundation wall.

Note 1. If electricity is to be supplied to the building a "concrete encased electrode" per NEC 250-52 is to be installed in the footings.

Note 2. Reinforcing steel in the footings is not to be supported by pieces of reinforcing steel driven into the ground.

Note 3. A soil analysis and/or foundation recommendation from a Montana registered engineer are required for commercial projects and residential construction projects.

What are the footing requirements for patio and porch decks?

Patio and porch decks attached to a structure are required to have footings adequate to support the imposed loads and to be protected from frost heave damage. The following are acceptable options for support:

- Correctly sized footings that extend a minimum of 3 feet below finished grade.
- Gravel or crushed rock that extends a minimum of 3 feet below finished grade and correctly sized footing that extends into the gravel at least 6 inches.
- With engineering, a treated wooden post that extends a minimum of 3 feet below finished grade may be used.