

BASEMENT CONSTRUCTION GUIDE

Where a design is not provided, the minimum foundation requirements for stud bearing walls shall be as set forth in Table 404.1.2(12), unless expansive soils of a severity to cause differential movement are known to exist.

A footing inspection is required when forms are completed but prior to pouring concrete. When foundation walls are to be poured concrete, an inspection is required when forms are completed, and reinforcement is in place but prior to pouring concrete. If foundation walls are to be wood refer to the Wood Basement Construction Guide.

Foundations supporting wood shall extend at least 6 inches above the adjacent finished grade.

Drain tile shall be required on both sides of the concrete footing or outside only with 2-inch drains through the footing into the fill under the slab at six-foot intervals. Drain tile is required to be covered with a washed granular material. Full basements are required to be backfilled to a minimum depth of 2 feet above the top of the footing with washed granular material. The granular material is required to be covered with a piece of perforated film or felt paper and a minimum of 2 feet of pit run. Garden level basements are required to be backfilled to a minimum depth of 1 foot above the top of the footing with washed granular material followed by the film or felt.

Basement floors are required to have 4 inches of washed granular material and a six-mil poly directly underneath the slab. The minimum thickness of concrete floor slabs supported directly on the ground shall not be less than 3.5 inches.

Anchor bolts shall be ½ inch in diameter and embedded at least 7 inches into concrete and shall be spaced not more than 6 feet apart.

At least one egress window is required in all new basements and in all basement sleeping rooms. Windows shall have a finished sill height of not more than 48 inches above the floor. The minimum width is 20 inches and the minimum height is 24 inches while the total openable area must be 5.7 sq ft. Please note that a 20-inch-wide window and 24 inch high window would not meet the requirements because of being short of the 5.7 sq ft.

TABLE 404.1.2(12)
FOUNDATIONS FOR STUD BEARING WALLS-MINIMUM REQUIREMENTS ^{1 2 3 4}
UNDER CONDITIONS NOT REQUIRING SPECIAL DESIGN

Number of Floors Supported By The Foundation ⁵	Thickness of Foundation Wall		Height of Wall (inches)	Width of Footing (inches)	Thickness of Footing (inches)	Depth of Foundation Below Finished Grade (inches)	Depth Below Undisturbed Ground Surface (inches)
	Concrete	Masonry					
1	6	6	48 or less	16	8	48	12
	8	8	48 or less	16	8	48	12
	8	10	48 to 108	16	8	48	12
2	8	10	Max 108	16	8	48	18
3	10	10	Max 108	20	10	48	24

See back for reinforcement requirements

¹ Foundation walls greater than 9 feet in height shall be designed by a licensed professional engineer.

² Minimum requirements when an engineered foundation design is not provided. Foundations subject to excessive lateral pressures created by unstable soil or groundwater conditions shall be designed by a licensed engineer.

³ Detached garage foundations may be constructed on concrete slabs provided such slabs are at least 4 inches thick and thickened to at least 12 inches at all edges, and thickened edges have a horizontal width of at least 8 inches at their base. Detached garage slabs constructed on compacted fill shall be provided with reinforcement conforming to the requirements of the latest edition of the Concrete Reinforced Steel Institute Design Handbook.

⁴ All footings shall be reinforced with a minimum of two continuous horizontal No. 4 reinforcing.

⁵ Foundations may also support a roof. A foundation supporting a roof only, shall be considered as supporting one floor.

TABLE 404.1.2(13)
MINIMUM REINFORCEMENT FOR CONCRETE FOUNDATION WALLS

Wall Height Feet	Wall Thickness Inches	Vertical Reinforcing	Horizontal 6 Reinforcing
4	6 ⁷	#4 @ 48" o.c.	#4 @ 24" o.c.
4	8	#4 @ 48" o.c.	#4 @ 24" o.c.
8	8	#4 @ 24" o.c. #5 @ 40" o.c.	#4 @ 24" o.c.
	10	#4 @ 30" o.c. #5 @ 50" o.c.	#4 @ 24" o.c.
9	8	#4 @ 18" o.c. #5 @ 28" o.c.	#4 @ 24" o.c.
	10	#4 @ 24" o.c. #5 @ 36" o.c.	#4 @ 24" o.c.

⁶ Top and bottom bars shall not be less than 3 inches or more than 8 inches from the top and bottom of the wall.

⁷ Six inch walls are only permitted with equal -backfill on each side.

TABLE 404.1.2(14)
MINIMUM REINFORCEMENT FOR MASONRY FOUNDATION WALLS

Wall Height Feet	Wall Thickness Inches	Vertical ⁸ Reinforcing	Horizontal Reinforcing
4	6 ⁷	#4 @ 48" o.c.	Minimum 9-guage side and cross runs every 16"
4	8	#4 @ 48" o.c.	
8	10	#4 @ 24" o.c. #5 @ 40" o.c.	
	12	#4 @ 32" o.c. #5 @ 40" o.c.	
9	10	#4 @ 16" o.c. #5 @ 24" o.c.	
	12	#4 @ 16" o.c. #5 @ 24" o.c.	

⁷ Six inch walls are only permitted with equal backfill on each side.

⁸ Masonry foundation walls shall have all cells with vertical reinforcement filled solid with concrete.