

**Chester
Building Official
Code Enforcement**

Thom Roy
84 Chester Street
Chester, NH 03036
603-887-5552
603-887-4404 (fax)
chester@gsinet.net



FOUNDATIONS - RESIDENTIAL

For all new construction a "foundation certification" is required at the time of foundation inspection. This certification must be provided at the time of the foundation inspection and before continuing work – and prior to framing. A land surveyor or similar professional can provide this.

A certified foundation plan is required to protect you, the owner/contractor, in insuring that the foundation, as located complies with all zoning setback requirements before proceeding with further construction activities. Some owner/contractors actually take the foundation certifications at the time of footing placements – further insuring that the structure as planned in the field actually meets the placement setback requirements. A foundation certification is specifically required by the Chester Zoning Ordinance and therefore is not waiver-able. This requirement will be applied to all buildings greater than 600 square feet.

The requirements for normal concrete footings and foundations are as interpreted from Chapter 4 of the International Residential Code (IRC). Basically all foundations will require some form of re-bar reinforcement as a matter of practice. A 10" thick, 8' high foundation wall placed in good soil classes might not require additional "vertical" reinforcement; however all foundations require some horizontal reinforcement.

Once re-bar is incorporated into the foundation wall system a "ufer" ground or bonding (concrete-encased electrode) of the re-bar is a mandatory electrical code provision and as such is required.

Emergency Egress & Escape:

All residential basement foundations must provide for an emergency escape and rescue opening (EE&RO). This will either be in the form of a bulkhead, standard swing door, or a window well sufficient to provide compliance to the code.

Frost Protection:

Footings shall be a minimum of 48" below grade at all points unless otherwise protected from frost. Insure the step-down area in front of the garage wall footing meets this same requirement. This requirement is applied to all structures greater than 600 square feet.

Damp Proofing and Foundation Drain:

Damp proofing is required in all instances – in some instances waterproofing may be required. A well-constructed foundation drain is required and must meet the following requirements:

- Drainage trench sized to a minimum of 14 inches in width and 12 inches in height
- Drain cannot be located within the 45 degree line of the footing bottom – cannot be too low
- Drainage pipe must sit in a minimum of 2 inches of pre-installed crushed stone (under the drainage pipe) and be covered with a minimum of 6 inches of drainage stone (over the drainage pipe)
- Drainage stone must extend a minimum of 12" inches beyond the outside edge of the footing
- Drainage stone must be installed to a depth of at least 6" above the top of the footing.
- Invert of the drainage pipe can be no higher than slab/floor
- Drainage must be covered with a membrane or fabric
- Drainage exit must extend beyond foundation and must drain to "daylight"

Vapor Barrier:

A vapor barrier is required under the slab. Minimum 6-mil poly with all seams overlapped.

Penetrations:

All penetrations must have a sleeve protection; two sizes larger and must be sealed from the outside.

9/17/2014

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Footings:

- Footings are to be placed on undisturbed natural soils. When the site has been over-dug then compaction must be done for all placed footings on all soil types. The footing must be continuous and must not be broken.
- Load bearing pressures for soils shall be considered not greater than 2000psf unless otherwise determined by an approved agency acceptable to the building official.
- Concrete specified strength should not be less than a minimum of 2500psf unless otherwise engineered. 3000psf should be considered.
- Width and thickness of footings are referenced in R403 of the IRC. The minimum thickness of the spread footing is 6"; however this is further controlled by the actual foundation thickness and requirements for minimum projection. Minimum projection width is 2". The projection width cannot exceed the thickness in any case.
- Vertical dowels placed such that #4 bars spaced at 32" OC or #5 bars spaced at 48" OC along the joint between the wall and the footing. No "T" slots are acceptable without vertical dowels placed as required here.

Foundation Wall:

Generally all foundations require horizontal reinforcement as provided by Table R404.1.2 (1). The minimum horizontal reinforcement for basement walls of 8' or less is:

One # 4 bar within 12 inches of the top and one #4 bar near the mid-height.

Vertical reinforcement is a variable defined by the tables within the code provisions. A 10" wall of 8' height and only 7' foot of unbalanced backfill is allowed without vertical reinforcement. Most other wall dimensions may require vertical reinforcement rebar. An 8" wall requires vertical reinforcement. Other foundation requirements are:

- 2500psf compression strength concrete (minimum).
- Anchor bolts – min ½ inch, located at 6 foot max and within 12 in. of end of plate lumber (not closer than 1 ¾" to end/edge). Minimum penetration into concrete = 7 inches
- Sill pockets must provide ½ inch clearance on all sides – sides and face of beam/girder.
- All through wall penetrations require sleeves. All penetrations must be sealed.
- PT planned for sill plate with sufficient sealing/insulation – nuts and washers in place
- Grading, drainage, and swales as required insuring no containment of water. A minimum of 6 inches of fall within 10 feet of foundation. Ground shall be graded, compacted and level

FOUNDATION WALL EXAMPLES:

Soil classes of material are shown in chapter 4 of the IRC.

(This example below assumes a minimum of GM, GC, SM, SM-SC & ML class of soil and is as taken from the vertical reinforcement table requirements within the IRC)

The maximum permitted unbalanced fill against an 8" thick plain concrete wall 8' or 9' tall is 6'. Therefore most 8" walls would require vertical reinforcement with rebar. From Table R404.1.2(8); a #5 bar @ 41 inches is shown for an 8' wall with 7' of unbalanced backfill. Horizontal rebar is also required.

The maximum permitted unbalanced fill against a 10" thick plain concrete wall 8' or 9' tall is 7'. While a 10" wall might not require vertical reinforcing rebar; however two rows of horizontal rebar are required.

Foundation wall design provisions are shown in the IRC in table R404.1.2(8) and may be approved provided they meet the requirements of the prescriptive code. Any requirements not specifically within the prescriptive provisions must be stamped by a design engineer and otherwise approved by the Building Inspector prior to permitting.