

Retaining Walls: When a Building Permit is Required

Community Development/Building Division

Background

One of the first major projects for the owners of a new production, new custom or a resale home is the rear yard landscaping. Very often this landscaping will require the use of retaining walls, particularly in those developments where the owner may want to cut back sloping grades in the rear yard or side yards. The intent of this article is to clarify the requirements for when a building permit is required for the installation of a retaining wall.

Retaining Walls & Definitions

A *retaining wall* is a wall designed to resist lateral (sideways) earth and/or fluid pressures, including any *surcharge* (*extra loads like structures, cars, etc.*), in accordance with accepted engineering practice. This definition also applies to freestanding pool walls.

The City of Folsom has adopted the *2013 California Building Code (CBC)* that states:

“A building permit shall not be required for ... retaining walls that are not over 4 feet in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge ...”

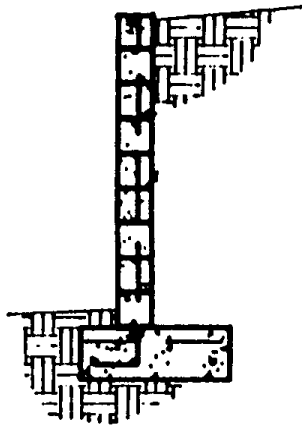
It is a common misconception by builders, designers, landscape contractors, pool contractors and homeowners that this section of the *CBC* allows retaining walls of up to 4 feet in *exposed wall height* to be constructed without a permit, regardless of the back slope conditions.

In order to interpret this building code section correctly, a clear understanding of the following terms is essential:

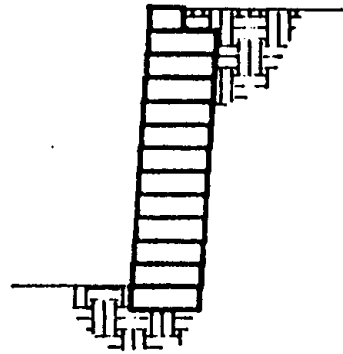
- **Retained Wall Height** is the vertical distance measured from the bottom of the footing to the finish grade at the top of the wall (i.e. upper soil grade). This is the height referred to in *CBC* and it includes the wall and depth of footing below grade.
- **Exposed Wall Height** is the vertical distance measured from the finish grade at the bottom of the wall (i.e. lower soil grade) to the finish grade at the top of the wall (i.e. upper soil grade). This height does not include the wall and depth of footing below grade.
- **Surcharge** is a vertical load imposed on the retained soil that may impose a lateral force in addition to the lateral earth pressure of the retained soil. Examples of surcharges are:
 - sloping retained soil
 - structure footings supported by the retained soil
 - adjacent vehicle loads supported by the retained soil

Solid fences that are attached (or directly adjacent) to a retaining wall also impose additional lateral forces on a retaining wall when wind pressures act on the fence.

- **Cantilever Retaining Wall** is typically constructed of reinforced concrete masonry units or reinforced concrete stem wall supported on a reinforced concrete footing.
- **Segmental Gravity Wall** is typically constructed of manufactured (i.e. Allan Block, Earthstone, Keystone, etc.) modular concrete units stacked in a running bond pattern without mortar or reinforcement.



Cantilever Wall



Segmental Gravity Wall

A typical cantilever reinforced masonry (or concrete) retaining wall will utilize a footing with a thickness of at least 12 inches. Based on this minimum footing thickness, a retaining wall with a maximum retained wall height of 4 feet would correspond to maximum exposed wall height of 3 feet.

Contractors and homeowners are usually more aware of the vertical offset between the upper and lower grade elevations that will be required for the retaining wall. This is simply the exposed wall height and it is for this reason that the Building Division interprets the *CBC* as follows:

“A building permit shall not be required for ... retaining walls that are not over 3 feet in exposed wall height unless supporting a surcharge ...”

Building Permit Requirements

A building permit is NOT required for:

- Cantilever or segmental gravity retaining walls with an exposed wall height of three feet or less, where the retained soil does not support a surcharge (i.e. level backfill only) and the wall does not support a solid fence.
- Wood retaining walls (with or without a fence) with an exposed wall height of two feet or less, where the retained soil does not support a surcharge (i.e. level backfill only). All wood retaining walls shall be constructed entirely of treated wood.

All other retaining wall conditions such as taller walls, tiered walls, and/or walls supporting sloping backfill (or other surcharges) will generally require a building permit.

When a Building Permit is Required

A building permit can *usually* be issued over the counter when two copies of the following are provided along with a completed permit application:

1. **Plot Plan**, fully dimensioned, showing the location, extent, and height of the retaining wall in relation to any building structure, pool, property lines and public utility easements.
2. **Detail(s)** showing complete construction details with dimensions of the retaining wall. Detail(s) are to be wet stamped and signed by a California registered civil or structural engineer. For segmental gravity retaining walls, the detail(s) must clearly identify the block manufacturer, block type, drainage requirements, and maximum wall height.
3. **Structural Calculations** wet stamped and signed by a California registered civil or structural engineer (or standardized engineering calculations and ICC ES Evaluation Report for applicable segmental gravity retaining walls).

Segmental Gravity Walls

Segmental gravity retaining walls such as Keystone, Allan Block, etc. are frequently available from local building supply warehouse stores. Regardless of the permit requirements, it is important to follow the manufacturer's recommendations for each block type since the allowable wall heights vary significantly for each block type. For example, Keystone limits their *Garden Wall* (4" high x 12" wide x 9" deep) product to 2 feet in height ... or six blocks in height total. The Keystone *Legacy Block* (6" high x 16" wide x 10½" deep) product is limited to 3 feet in height ... or six blocks in height total. Neither of these block types is recommended when the retaining wall is supporting a sloping backfill, any other surcharge or a solid fence.

Tiered Retaining Walls

Use of *tiered walls* is a special condition where two or more short walls, horizontally offset from one another, are used in lieu of a single tall retaining wall. When tiered walls are not properly offset from each other, the upper wall may impose a surcharge condition on the lower wall. In order for the walls to be treated as separate retaining walls, a general rule of thumb is that the tiered walls be horizontally offset by a minimum distance of two times the *exposed wall height* of the lower wall.

As an example, two tiered retaining walls, each with an exposed wall height of 3 feet and level back fill, which are horizontally offset by a distance of 2 feet, would be treated as a single 6 foot tall wall and as a result, a building permit would be required.

Questions?

Should you have any questions, please stop by the public counter of the Community Development Department/Building Division or call 916-351-3555.