



Policy 10

RETAINING WALLS

All construction, modification, and repair of retaining walls require a permit. Retaining walls that are monolithically placed and structurally tied to a house or building foundation will be permitted and approved under the building permit. Retaining walls located on private property are the responsibility of the property owner. The City of Knoxville Department of Engineering classifies retaining walls as critical walls or non-critical walls.

The Director of the Department of Engineering has authority to modify the requirements of this policy on a case by case basis.

Critical Walls

Critical walls are walls where the distance between the face of the retaining wall (regardless of height) and a critical feature is less than the wall's height, thus having the potential to affect the critical feature during the wall's failure. Critical features are public right-of-way, stormwater infrastructure, structures where people reside, or adjacent property. A wall's height is defined as the maximum difference between grade elevations on either side of the wall.

Non-Critical Walls

Non-critical walls are walls that do not meet the critical wall definition.

Permitting Requirements

Type of Wall	Site Plan	Typical Section	PE Stamp	Section Design	Calculations	Development Certification
Non-Critical Wall Max Height 5 ft	X					
Non-Critical Wall Max Height 10 ft	X	X	X	X		
Non-Critical Wall Height Greater than 10 ft	X	X	X	X	X	
Critical Wall	X	X	X	X	X	X

Site Plan

Show the wall's location in reference to all property lines, structures, and all other critical features. It must include existing and proposed contours (2 ft minimum), easements, parking facilities, drainage features, existing or proposed site features, and the wall's maximum height.

Typical Section

Show wall and footing dimensions, backfill slopes and material, finished grade elevations, steel reinforcements details, weephole locations, subsurface drainage system, and all other critical features to the wall's design.

Calculations

Must note all assumptions such as concrete and steel reinforcements strengths, soil parameters, surcharges, bearing pressures, safety factors for bearing capacity, overturning, and sliding. The minimum required factors of safety are as follows:

Bearing Capacity = 3.0

Overturning = 2.0

Sliding = 1.5

A reasonable allowable bearing capacity should be used.

Development Certification

A geotechnical report, stamped by a Professional Engineer, must be included with the retaining wall design and calculations submittal or with the Development Certification Submittal. The geotechnical report must verify the assumed bearing capacity is acceptable. If the bearing capacity is not acceptable the wall must be addressed by the appropriate design professional, which may include redesign, modification, or reconstruction. Wall elements must be inspected by a 3rd party engineer, the 3rd party certification must be submitted as part of the Development Certification. The 3rd party certification must confirm construction meets or exceeds the original design. City of Knoxville inspectors may certify poured in place walls in place of a 3rd party engineer.

Large Segmental Block Walls

Walls that are 5 feet tall or less (which are not associated with a water impoundment feature) and are constructed of manufactured solid masonry blocks that are at least 2 feet wide (as measured from face of wall to back of wall) do not require calculations, development certification, PE Stamp, or closure of peripheral utility and drainage easements. The walls must be constructed per the manufacturer's specifications.

Terraced Walls

If at any point the distance between the faces of terraced walls is less than the height of the tallest wall, the walls must be designed with consideration of the interdependent nature of the walls. In this case, the difference between the bottom grade of the lower wall and the top grade of the upper wall should be considered in the analysis.

Utility and Drainage Easements

The majority of lots have dedicated utility and drainage easements along their perimeter. If a non-critical wall is to be located in the perimeter utility and drainage easement and a utility or drainage facility is located in the easement, the applicant must obtain written permission from the utility provider before the wall can be permitted. If a critical wall is to be placed in a perimeter utility and drainage easement the easement must be addressed (typically by closure of the utility and drainage easement).

If a wall is proposed in another type of easement the applicant must obtain written permission from the entities who have rights to the easements.

Engineered Slopes

Slopes that exceed 2 horizontal : 1 vertical must be designed by a Professional Engineer. If the slope also meets the requirements of a critical wall the slope must be certified through the Development Certification process. A slope is deemed critical when the height of the slope, that is steeper than 2 horizontal : 1 vertical, is greater than the distance between any part of the slope and a critical feature.