

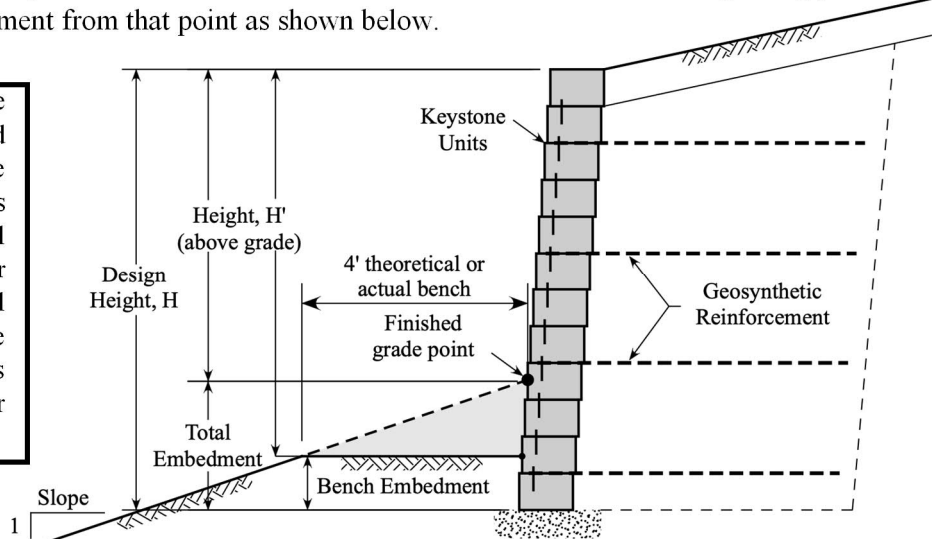
# Wall Embedment

The foundations of all retaining wall systems are placed a specified distance below finished grade to provide adequate erosion protection, frost protection, foundation bearing capacity, and overall global stability when slopes are involved. The design of flexible modular retaining wall systems is not as concerned with frost related issues as with rigid structures but erosion protection, local bearing capacity, and global stability issues must be evaluated for each design situation encountered.

The minimum practical embedment for any small wall structure with a level toe slope is 6" or one block unit below finished grade. As a wall gets taller or is placed in less stable sloping toe conditions, the embedment must be increased to satisfy stability requirements. It is easiest to understand minimum wall embedment criteria when a typical cross section is evaluated.

Typically, a finished grade point is established where the ground in front of the wall intersects the wall face alignment. Sometimes the grading accounts for a level bench in front of the wall but most of the time the finished grade is the intersection of the existing or proposed ground slope with the wall face. It is good practice to construct an imaginary 4' bench in front of the wall if one is not indicated in the grading plans and establish the minimum embedment from that point as shown below.

The recommendations in the table are general in nature and do not replace a comprehensive stability analysis in those areas with erosion or scour, poor soil conditions, submerged toes, or steep toe slopes. Special consideration should always be given to man-made fill slopes which can exhibit poor structural performance.



**Typical Wall Embedment Section**

## Various Embedment Criteria

Toe Slope Condition	Minimum Embedment	
	NCMA	AASHTO
Horizontal (walls)	H'/20	H'/20
Horizontal (abuts)	H'/10	H'/10
3H:1V	H'/10	H'/10
2H:1V	H'/7	H'/7
1.5H:1V	-	H'/5
Minimum	0.5'	*2.0'

\*provision for 1' min. embedment exists in current AASHTO code

Note: NCMA bases minimum embedment on exposed height, H', and does not acknowledge bench considerations. AASHTO bases minimum embedment on total height and requires a 4' bench for sloping toe conditions in addition to the table requirements. FHWA is somewhere in between in its recommendations.

## Suggested Wall Embedment

Toe Slope Condition	Bench Embedment	Total Embedment
Level	10% H'	10% H'
3H:1V	10% H'	1.3' + 10% H'
2H:1V	10% H'	2' + 10% H'
1.5H:1V	10% H'	2.7' + 10% H'

Note: H' could be measured from finished grade or bench elevation depending on if bench is actually constructed or not.

(Note: 10% of exposed wall height is a good rule of thumb provided that toe slope conditions are properly evaluated and bench construction is assumed. There can be arguments for more or less embedment with sloping toe conditions which have to be determined on a project specific basis