



**ALLAN  
BLOCK**  
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# Building Bigger Gravity Walls

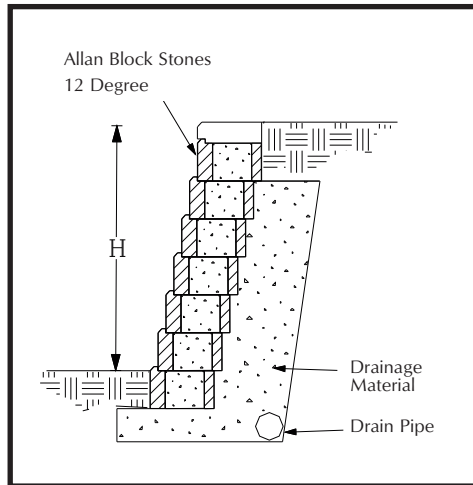
The “Allan Block Design Manual” and the “Allan Block Engineering Manual” provide a thorough explanation of the mathematical calculations for gravity wall analysis. Throughout the examples found in both of these documents, we have limited gravity walls to 1 ft (0.3 m) in depth. The following discussion will stimulate your imagination to solve earth retention problems with creative gravity wall designs.

A retaining wall that relies on its own weight to stand up is called a *gravity wall*. Allan Block combines the basic engineering principles of setback, leverage and total unit mass with simple mechanics to make highly stable gravity walls.

There are three main characteristics that determine how well any gravity wall will work. The final wall height will be dependent on these characteristics: **Setback** or batter **Depth** and **Weight** of the wall.



**Mortared Stone Gravity Wall**  
Malaysia



**Setback:** Allan Block has developed a family of retaining wall products that produce setbacks of three, six and twelve degrees. The twelve degree setback of Allan Block is the most important reason for the overwhelming success of our products in the field. Leverage created by batter on the Original Allan Block and AB Stones provides for the perfect balance of form and function.

**Depth:** With the exception of the Allan Block Junior & Border Block, we have limited the depth of our units to 1 ft (0.3 m). Production efficiencies and ease of installation are the driving forces behind the sizing.

**TABLE 1**

1 Ft (0.3 m) Deep AB Gravity Wall - Maximum Heights				
Soil Type	PHI	3°	6°	12°
Firm to Silty Clay	27°	2.5 ft	2.75 ft	3.25 ft
		0.76 m	0.84 m	1.0 m
Silty Sand	32°	3.0 ft	3.5 ft	4.45 ft
		0.9 m	1.07 m	1.36 m
Clean Sand/Gravel	36°	3.5 ft	4.0 ft	5.5 ft
		1.07 m	1.22 m	1.68 m

**TABLE NOTE:**

- No surcharge
- Level slope above wall

• Walls that exceed these heights will need reinforcement.

Another characteristic that controls the effectiveness of any gravity wall is the **Weight** of the wall. The patented hollow core design of Allan Block delivers the most efficient product on the market yet provides for installed unit weights equal to or greater than all of the competition. Following is an explanation of how our basic design concept of filling the cores of the block with aggregate can be expanded to create a deeper gravity wall capable of providing alternative solutions to your retaining wall problems.

See TABLE 1 for maximum gravity wall heights using standard 1 ft (0.3 m) deep Allan Block retaining wall units in

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various soil conditions.

Over the past year we have worked on many jobs where TABLE 1 gravity wall heights were not sufficient for the site conditions. In addition, excavation to provide the extra reinforcement required was not an option. Situations such as this require innovative solutions.

Allan Block, with it's unique ability to adapt to unusual site conditions, provides a simple solution by constructing walls that are 2 ft (0.6 m) deep using two 1 ft (0.3 m) units. One example project in Vancouver, British Columbia, contained 5,000 ft<sup>2</sup> (465 m<sup>2</sup>) of wall. Most of the grade changes required wall heights of 4 ft (1.2 m) or less. The exception was a 50 ft (15.2 m) stretch requiring a 7 ft (2.1 m) high wall.

This section had two oak trees estimated to be between 95 and 100 years old. Excavation for geogrid reinforcement or the use of earth anchors was ruled out. However, a 2 ft (0.6 m) deep wall would create enough leverage to provide a solution to the problem. The additional 350 Allan Blocks required for this wall design provided the most economical answer and allowed Allan Block to provide a good solution for the customer.

See TABLE 2 for maximum wall heights using two 1 ft (0.3 m) deep Allan Block retaining wall units in various soil conditions.

Double sided Allan Block walls can expand our gravity wall concept beyond the 2 ft (0.6 m) example shown. Refer to the adjacent illustration and let your imagination guide you to endless solutions for your customers.

Contact the Allan Block Engineering Department for more information, 800-899-5309.

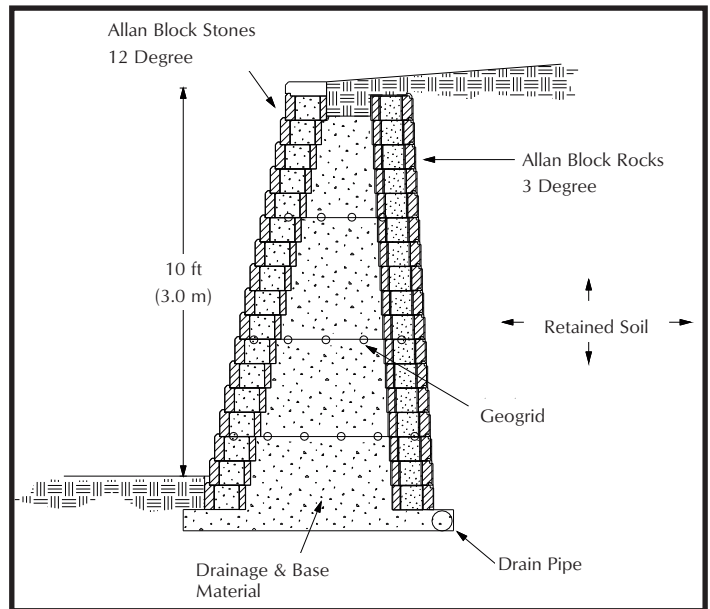
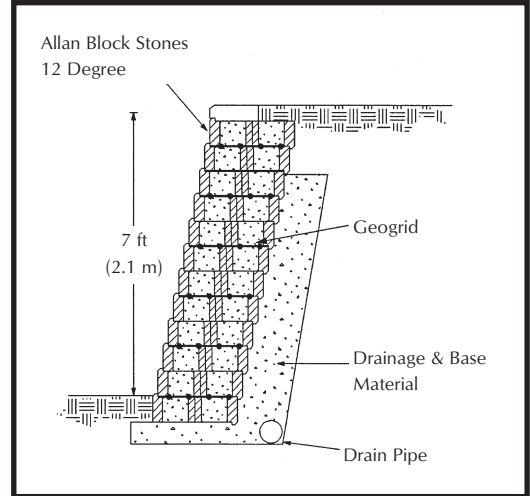
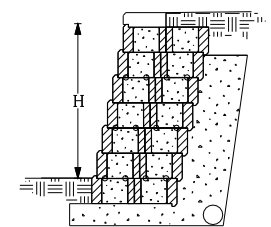


TABLE 2

2 Ft (0.6 m) Deep AB Gravity Wall Maximum Heights				
Soil Type	PHI	3°	6°	12°
Firm to Silty Clay	27°	5.0 ft	5.5 ft	6.5 ft
		1.52 m	1.68 m	1.98 m
Silty Sand	32°	6.0 ft	7.0 ft	9.0 ft
		1.83 m	2.14 m	2.75 m
Clean Sand/Gravel	36°	7.0 ft	8.0 ft	10.0 ft
		2.13 m	2.44 m	3.04 m

TABLE NOTE:

- No surcharge
- Level slope above wall



• Walls that exceed these heights will need reinforcement.

The information shown here is for use with Allan Block products only.



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