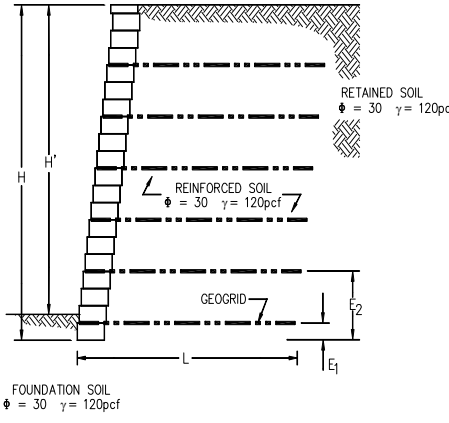


# Nicolock's Firma Wall - Geogrid Material Estimating Chart

<b>CASE 1 with <math>\phi &gt; 30^\circ</math></b> <b>NO SURCHARGE</b> <b>NO SLOPE AT TOP OF WALL</b>	Exposed Height H', (ft)	Total Height H, (ft)	No. of Firma Wall Courses	Grid Layers	Length L, (ft)	Layer Number							
						Place Grid at Elevation E <sub>i</sub> (ft)							
						1	2	3	4	5	6	7	
	2.3	2.8	5	-	-	-	-	-	-	-	-	-	-
	2.8	3.3	6	2	4.0	1.0	2.0	-	-	-	-	-	-
	3.3	3.8	7	2	4.0	1.0	2.5	-	-	-	-	-	-
	3.8	4.3	8	2	4.0	1.0	3.0	-	-	-	-	-	-
	4.3	4.8	9	2	4.0	1.0	3.0	-	-	-	-	-	-
	4.8	5.3	10	3	5.0	1.0	3.0	4.0	-	-	-	-	-
	5.3	5.8	11	3	5.0	1.0	3.0	4.5	-	-	-	-	-
	5.8	6.3	12	3	6.0	1.0	3.0	5.0	-	-	-	-	-
	6.3	7.3	14	4	6.0	1.0	3.0	5.0	6.0	-	-	-	-
	6.8	7.8	15	4	7.0	1.0	3.0	5.0	6.5	-	-	-	-
	7.3	8.3	16	4	7.0	1.0	3.0	5.0	7.0	-	-	-	-
	7.8	8.8	17	4	7.0	1.0	3.0	5.0	7.0	-	-	-	-
	8.3	9.3	18	5	7.0	1.0	3.0	5.0	7.0	8.0	-	-	-
	8.8	9.8	19	5	8.0	1.0	3.0	5.0	7.0	8.5	-	-	-
9.3	10.3	20	5	8.0	1.0	3.0	5.0	7.0	9.0	-	-	-	
9.8	10.8	21	5	8.0	1.0	3.0	5.0	7.0	9.0	-	-	-	
10.3	11.3	22	6	9.0	1.0	3.0	5.0	7.0	9.0	10.0	-	-	
10.8	11.8	23	6	9.0	1.0	3.0	5.0	7.0	9.0	10.5	-	-	
11.3	12.3	24	6	9.0	1.0	3.0	5.0	7.0	9.0	11.0	-	-	
<b>CASE 2 with <math>\phi &gt; 30^\circ</math></b> <b>SURCHARGE FROM ROADWAY OR PARKING</b> <b>NO SLOPE AT TOP OF WALL</b>	2.3	2.8	5	1	4.0	1.0	-	-	-	-	-	-	-
	2.8	3.3	6	2	4.0	1.0	1.5	-	-	-	-	-	-
	3.3	3.8	7	2	4.0	1.0	2.0	-	-	-	-	-	-
	3.8	4.3	8	2	5.0	1.0	2.5	-	-	-	-	-	-
	4.3	4.8	9	2	6.0	1.0	3.0	-	-	-	-	-	-
	4.8	5.3	10	3	6.0	1.0	3.0	3.5	-	-	-	-	-
	5.3	5.8	11	3	6.0	1.0	3.0	4.0	-	-	-	-	-
	5.8	6.3	12	3	6.0	1.0	3.0	4.5	-	-	-	-	-
	6.3	7.3	14	4	7.0	1.0	3.0	5.0	5.5	-	-	-	-
	6.8	7.8	15	4	7.0	1.0	3.0	5.0	6.0	-	-	-	-
	7.3	8.3	16	4	7.0	1.0	3.0	5.0	6.5	-	-	-	-
	7.8	8.8	17	4	8.0	1.0	3.0	5.0	7.0	-	-	-	-
	8.3	9.3	18	5	8.0	1.0	3.0	5.0	7.0	7.5	-	-	-
	8.8	9.8	19	5	8.0	1.0	3.0	5.0	7.0	8.0	-	-	-
9.3	10.3	20	5	9.0	1.0	3.0	5.0	7.0	8.5	-	-	-	
9.8	10.8	21	5	9.0	1.0	3.0	5.0	7.0	9.0	-	-	-	
10.3	11.3	22	6	9.0	1.0	3.0	5.0	7.0	9.0	9.5	-	-	
10.8	11.8	23	6	9.0	1.0	3.0	5.0	7.0	9.0	10.0	-	-	
11.3	12.3	24	6	10.0	1.0	3.0	5.0	7.0	9.0	10.5	-	-	
<b>CASE 3 with <math>\phi &gt; 30^\circ</math></b> <b>NO SURCHARGE</b> <b>3:1 MAX SLOPE AT TOP OF WALL</b>	2.3	2.8	5	1	4.0	1.0	-	-	-	-	-	-	-
	2.8	3.3	6	2	4.0	1.0	2.0	-	-	-	-	-	-
	3.3	3.8	7	2	4.0	1.0	2.5	-	-	-	-	-	-
	3.8	4.3	8	2	5.0	1.0	3.0	-	-	-	-	-	-
	4.3	4.8	9	2	5.0	1.0	3.0	-	-	-	-	-	-
	4.8	5.3	10	3	6.0	1.0	3.0	4.0	-	-	-	-	-
	5.3	5.8	11	3	6.0	1.0	3.0	4.5	-	-	-	-	-
	5.8	6.3	12	3	6.0	1.0	3.0	5.0	-	-	-	-	-
	6.3	7.3	14	4	7.0	1.0	3.0	5.0	6.0	-	-	-	-
	6.8	7.8	15	4	8.0	1.0	3.0	5.0	6.5	-	-	-	-
	7.3	8.3	16	4	8.0	1.0	3.0	5.0	7.0	-	-	-	-
	7.8	8.8	17	4	8.0	1.0	3.0	5.0	7.0	-	-	-	-
	8.3	9.3	18	5	9.0	1.0	3.0	5.0	7.0	8.0	-	-	-
	8.8	9.8	19	5	9.0	1.0	3.0	5.0	7.0	8.5	-	-	-
9.3	10.3	20	5	10.0	1.0	3.0	5.0	7.0	9.0	-	-	-	
9.8	10.8	21	5	10.0	1.0	3.0	5.0	7.0	9.0	-	-	-	
10.3	11.3	22	7	10.0	1.0	2.0	3.0	5.0	7.0	9.0	10.0	10.0	
10.8	11.8	23	7	11.0	1.0	2.0	3.0	5.0	7.0	9.0	10.5	10.5	
11.3	12.3	24	7	11.0	1.0	2.0	3.0	5.0	7.0	9.0	11.0	11.0	

- Notes:**
- Information presented in this chart is to be used for estimating purposes. Final design should be performed by a Professional Engineer qualified in both geotechnical engineering and segmental retaining wall design.
  - This estimating chart is applicable to sites where soil conditions meet the following minimum criteria: Angle of Internal Friction,  $\phi > 30^\circ$  and moist unit weight,  $\gamma < 120\text{pcf}$ . Typical for silty sands, poorly graded sands, and well grade fine to medium sands meeting the following USCS classifications: **SM, SP, or SW**.
  - Estimating charts prepared for use with Nicolock Firma Wall block system and Strata System's type **Stratagrid 200** or TenCate Geosynthetics' type **Miragrid 3XT** reinforcing geogrids. Grids **MUST** extend to the front face of the block.
  - Definitions:  
 H' = exposed height, in feet  
 H = total height, in feet  
 L = length of Geogrid required, in feet  
 $\phi$  = angle of internal friction, degrees  
 $\gamma$  = moist unit weight, pounds per cubic foot  
 E<sub>i</sub> = elevation of grid layer from bottom of wall, in feet
  - These charts do not reflect any provisions for global stability or other analyses, which may be related to site-specific conditions including relief of excess hydrostatic pressures due to groundwater or springs. All these conditions should be checked and evaluated as appropriate, using site-specific soil and subsurface conditions, as well as any special loading criteria.
  - Design Minimum Factors of Safety: 1.5 for reinforcement pullout, 1.5 for external sliding, 2.0 for overturning, and 2.0 for bearing.
  - All walls shall be supported on an aggregate foundation and shall have adequate drainage provisions in accordance with Nicolock standard specifications and NCMA guidelines.
  - To the best of our knowledge, the information presented in this estimating chart is complete and accurate. However, Nicolock cannot assume any liability or accept any responsibility for the accuracy or completeness of this information. Further, Nicolock cannot assume any liability for damages arising from claims in which construction proceeded without final design drawings prepared by a Professional Engineer registered in the State of construction specializing in both geotechnical engineering and segmental retaining wall design.

