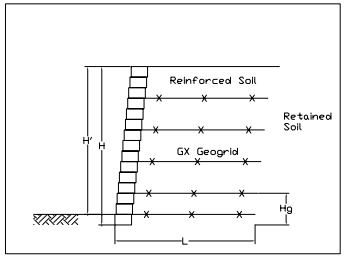
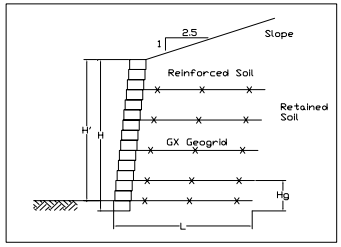
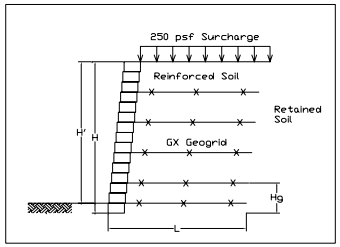
Versa-Lok Square Foot / GX™ Geogrid Segmental Retaining Wall Preliminary Design Chart

Site soils where ø ≥ 28° Also the moist unit weigt, g, ≤120 pcf. Values are typical for sandy clay, silty clays, clayey sand or silty sand (USCS: CL, ML, SC, SM)	Exposed Wall Height H', (ft.)	Total Wall Height H, (ft.)	Number of Versa-Lok Square Foot Courses	Geogrid Layers	Geogrid Length L, (ft.)	GX Geogrid Type	Layer Number Place Geogrid at Height Hg (ft.) 1	2	3	4	5	6	7
Case 1 	3'-3"	4'-0"	6	2	4'-0"	GX-150	1'-4"	2'-8"					
	4'-0"	4'-8"	7	2	4'-0"	GX-150	1'-4"	3'-4"					
	5'-4"	6'-0"	9	3	5'-0"	GX-150	1'-4"	3'-4"	4'-8"				
	6'-0"	6'-8"	10	3	5'-6"	GX-150	1'-4"	3'-4"	5'-4"				
	7'-0"	8'-0"	12	4	6'-0"	GX-300	1'-4"	3'-4"	5'-4"	6'-8"			
	7'-8"	8'-8"	13	4	6'-6"	GX-300	1'-4"	3'-4"	5'-4"	7'-4"			
	9'-0"	10'-0"	15	5	7'-0"	GX-300	1'-4"	3'-4"	5'-4"	7'-4"	8'-0"		
	11'-0"	12'-0"	18	6	8'-6"	GX-300	1'-4"	3'-4"	5'-4"	7'-4"	9'-4"	10'-0"	
Case 2 	3'-3"	4'-0"	6	2	5'-0"	GX-150	0'-8"	2'-0"					
	4'-0"	4'-8"	7	3	5'-6"	GX-150	0'-8"	2'-0"	3'-4"				
	5'-4"	6'-0"	9	3	7'-0"	GX-300	0'-8"	2'-0"	4'-0"				
	6'-0"	6'-8"	10	4	8'-0"	GX-300	0'-8"	2'-0"	4'-0"	5'-4"			
	7'-0"	8'-0"	12	4	8'-6"	GX-300	0'-8"	2'-0"	4'-0"	6'-0"			
	7'-8"	8'-8"	13	5	10'-0"	GX-300	0'-8"	2'-0"	4'-0"	6'-0"	7'-4"		
	9'-0"	10'-0"	15	5	11'-0"	GX-300	0'-8"	2'-0"	4'-0"	6'-0"	8'-0"		
	11'-0"	12'-0"	18	6	14'-0"	GX-500	0'-8"	2'-0"	4'-0"	6'-0"	8'-0"	10'-0"	
Case 3 	3'-3"	4'-0"	6	2	4'-0"	GX-150	0'-8"	2'-0"					
	4'-0"	4'-8"	7	2	5'-0"	GX-150	0'-8"	2'-8"					
	5'-4"	6'-0"	9	3	5'-6"	GX-150	0'-8"	2'-8"	4'-0"				
	6'-0"	6'-8"	10	3	6'-6"	GX-300	0'-8"	2'-8"	4'-8"				
	7'-0"	8'-0"	12	4	7'-0"	GX-300	0'-8"	2'-8"	4'-8"	6'-0"			
	7'-8"	8'-8"	13	4	8'-0"	GX-300	0'-8"	2'-8"	4'-8"	6'-8"			
	9'-0"	10'-0"	15	5	8'-6"	GX-300	0'-8"	2'-0"	4'-0"	6'-0"	8'-0"		
	11'-0"	12'-0"	18	6	10'-0"	GX-300	0'-8"	2'-0"	4'-0"	6'-0"	8'-0"	10'-0"	

Notes:

1. The above design chart is for preliminary estimates only. In all cases, the final design for construction should be performed by a qualified professional engineer using site specific soil condtions.

2. Definitions:

H' = Exposed wall height

H = Total wall height

Hg = Elevation of geogrid placement measured from the bottom of the segmental retaining wall

L = Length of geogrid measured from the front face of the Versa-Lok Square Foot retaining wall units.

3. This design chart has been prepared exclusively for Versa-Lok Square Foot retaining wall units and GX Geogrid based upon the assumptions indicated above.

4. Minimum design factors of safety are based on NCMA's Design Manual for Segmental Retaining Walls, 2nd Edition. This design chart does **NOT** include the effects of global stability.

5. The GX geogrid must be extended from the front face of the Versa-Lok Square Foot retaining wall units.

6. This design chart assumes no hydrostatic loading of the reinforced wall fill and that adequate drainage has been provided both during and after construction.

7. This design chart was developed specifically for use with GX Geogrid manufactured by Carthage Mills and Versa-Lok Square Foot segmental retaining wall units marketed by Versa-Lok. The facing connection strength data used in the development of this design chart is not suitable for other segmental retaining wall units.

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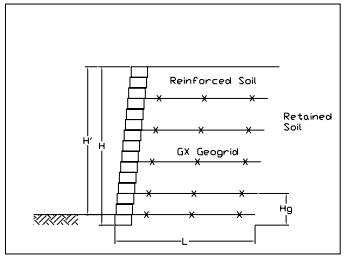
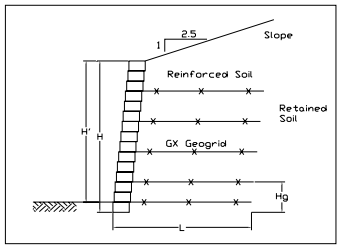
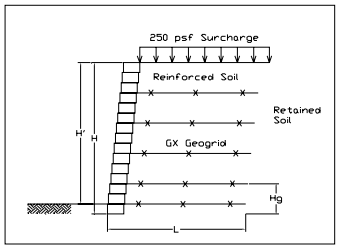
Versa-Lok Square Foot / GX™ Geogrid Segmental Retaining Wall Preliminary Design Chart

Site soils where ø ≥ 30° Also the moist unit weigt, g, ≤120 pcf. Values are typical for silty sands, poorly graded sand, and well graded sand (USCS: SM, SP, SW)	Exposed Wall Height H', (ft.)	Total Wall Height H, (ft.)	Number of Versa-Lok Square Foot Courses	Geogrid Layers	Geogrid Length L, (ft.)	GX Geogrid Type	Layer Number Place Geogrid at Height Hg (ft.) 1	2	3	4	5	6	7
Case 1 	3'-3"	4'-0"	6	2	4'-0"	GX-150	1'-4"	2'-8"					
	4'-0"	4'-8"	7	2	4'-0"	GX-150	1'-4"	3'-4"					
	5'-4"	6'-0"	9	2	5'-6"	GX-150	2'-0"	4'-0"					
	6'-0"	6'-8"	10	3	5'-6"	GX-150	2'-0"	4'-0"	4'-8"				
	7'-0"	8'-0"	12	3	6'-0"	GX-300	2'-0"	4'-0"	6'-0"				
	7'-8"	8'-8"	13	4	6'-6"	GX-300	2'-0"	4'-0"	6'-0"	6'-8"			
	9'-0"	10'-0"	15	4	7'-0"	GX-300	2'-0"	4'-0"	6'-0"	8'-0"			
	11'-0"	12'-0"	18	6	8'-0"	GX-300	0'-8"	2'-0"	4'-0"	6'-0"	8'-0"	10'-0"	
Case 2 	3'-3"	4'-0"	6	2	4'-0"	GX-150	0'-8"	2'-0"					
	4'-0"	4'-8"	7	2	4'-6"	GX-150	0'-8"	2'-8"					
	5'-4"	6'-0"	9	3	5'-6"	GX-300	0'-8"	2'-8"	4'-0"				
	6'-0"	6'-8"	10	3	6'-0"	GX-300	0'-8"	2'-8"	4'-8"				
	7'-0"	8'-0"	12	4	7'-0"	GX-300	0'-8"	2'-0"	4'-0"	6'-0"			
	7'-8"	8'-8"	13	5	7'-6"	GX-300	0'-8"	2'-0"	4'-0"	6'-0"	6'-8"		
	9'-0"	10'-0"	15	5	8'-6"	GX-300	0'-8"	2'-0"	4'-0"	6'-0"	8'-0"		
	11'-0"	12'-0"	18	6	10'-0"	GX-500	0'-8"	2'-0"	4'-0"	6'-0"	8'-0"	10'-0"	
Case 3 	3'-3"	4'-0"	6	2	4'-0"	GX-150	1'-4"	2'-0"					
	4'-0"	4'-8"	7	2	5'-0"	GX-150	1'-4"	2'-8"					
	5'-4"	6'-0"	9	3	5'-6"	GX-150	1'-4"	3'-4"	4'-0"				
	6'-0"	6'-8"	10	3	6'-0"	GX-150	1'-4"	3'-4"	4'-8"				
	7'-0"	8'-0"	12	4	7'-0"	GX-300	1'-4"	3'-4"	5'-4"	6'-0"			
	7'-8"	8'-8"	13	4	7'-6"	GX-300	1'-4"	3'-4"	5'-4"	6'-8"			
	9'-0"	10'-0"	15	5	8'-0"	GX-300	1'-4"	3'-4"	5'-4"	7'-4"	8'-0"		
	11'-0"	12'-0"	18	6	8'-6"	GX-300	1'-4"	3'-4"	5'-4"	7'-4"	9'-4"	10'-0"	

Notes:

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2. Definitions:

H' = Exposed wall height

H = Total wall height

Hg = Elevation of geogrid placement measured from the bottom of the segmental retaining wall

L = Length of geogrid measured from the front face of the Versa-Lok Square Foot retaining wall units.

3. This design chart has been prepared exclusively for Versa-Lok Square Foot retaining wall units and GX Geogrid based upon the assumptions indicated above.

4. Minimum design factors of safety are based on NCMA's Design Manual for Segmental Retaining Walls, 2nd Edition. This design chart does **NOT** include the effects of global stability.

5. The GX geogrid must be extended from the front face of the Versa-Lok Square Foot retaining wall units.

6. This design chart assumes no hydrostatic loading of the reinforced wall fill and that adequate drainage has been provided both during and after construction.

7. This design chart was developed specifically for use with GX Geogrid manufactured by Carthage Mills and Versa-Lok Square Foot segmental retaining wall units marketed by Versa-Lok. The facing connection strength data used in the development of this design chart is not suitable for other segmental retaining wall units.

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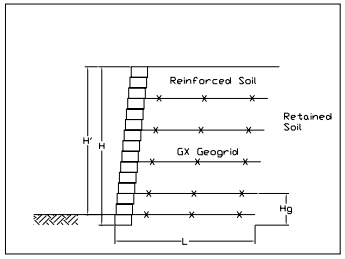
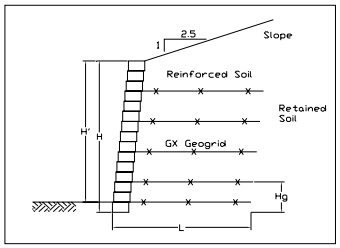
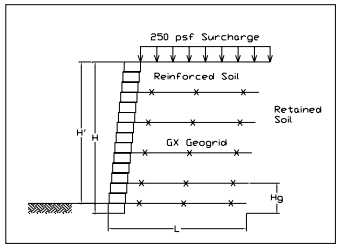
Versa-Lok Square Foot / GX™ Geogrid Segmental Retaining Wall Preliminary Design Chart

Site soils where ø ≥ 34° Also the moist unit weigt, g, ≤120 pcf. Values are typical for sand and gravel mixtures (USCS: GW, GP, GM)	Exposed Wall Height H', (ft.)	Total Wall Height H, (ft.)	Number of Versa-Lok Square Foot Courses	Geogrid Layers	Geogrid Length L, (ft.)	GX Geogrid Type	Layer Number Place Geogrid at Height Hg (ft.) 1	2	3	4	5	6	7
Case 1 	3'-3"	4'-0"	6	1	4'-0"	GX-150	2'-0"						
	4'-0"	4'-8"	7	2	4'-0"	GX-150	2'-0"	2'-8"					
	5'-4"	6'-0"	9	2	4'-0"	GX-150	2'-0"	4'-0"					
	6'-0"	6'-8"	10	3	5'-0"	GX-150	2'-0"	4'-0"	4'-8"				
	7'-0"	8'-0"	12	3	5'-6"	GX-150	2'-0"	4'-0"	6'-0"				
	7'-8"	8'-8"	13	4	6'-0"	GX-300	2'-0"	4'-0"	6'-0"	6'-8"			
	9'-0"	10'-0"	15	4	6'-6"	GX-300	2'-0"	4'-0"	6'-0"	8'-0"			
	11'-0"	12'-0"	18	5	8'-0"	GX-300	2'-0"	4'-0"	6'-0"	8'-0"	10'-0"		
Case 2 	3'-3"	4'-0"	6	2	4'-0"	GX-150	1'-0"	2'-0"					
	4'-0"	4'-8"	7	2	4'-6"	GX-150	1'-0"	3'-0"					
	5'-4"	6'-0"	9	2	5'-0"	GX-150	1'-0"	3'-0"	4'-0"				
	6'-0"	6'-8"	10	3	5'-6"	GX-300	1'-0"	3'-0"	5'-0"				
	7'-0"	8'-0"	12	3	6'-0"	GX-300	0'-6"	2'-0"	4'-0"	6'-0"			
	7'-8"	8'-8"	13	4	7'-0"	GX-300	0'-6"	2'-0"	4'-0"	6'-0"	7'-0"		
	9'-0"	10'-0"	15	4	7'-6"	GX-300	0'-6"	2'-0"	4'-0"	6'-0"	8'-0"		
	11'-0"	12'-0"	18	6	8'-6"	GX-500	0'-6"	2'-0"	4'-0"	6'-0"	8'-0"	10'-0"	
Case 3 	3'-3"	4'-0"	6	2	4'-0"	GX-150	1'-4"	2'-8"					
	4'-0"	4'-8"	7	2	4'-6"	GX-150	2'-0"	3'-4"					
	5'-4"	6'-0"	9	2	5'-0"	GX-150	2'-0"	4'-0"					
	6'-0"	6'-8"	10	3	5'-6"	GX-300	2'-0"	4'-0"	4'-8"				
	7'-0"	8'-0"	12	3	6'-6"	GX-300	2'-0"	4'-0"	6'-0"				
	7'-8"	8'-8"	13	4	7'-0"	GX-300	2'-0"	4'-0"	6'-0"	6'-8"			
	9'-0"	10'-0"	15	5	7'-6"	GX-300	2'-0"	4'-0"	6'-0"	8'-0"			
	11'-0"	12'-0"	18	6	8'-6"	GX-300	0'-8"	2'-0"	4'-0"	6'-0"	8'-0"	10'-0"	

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H = Total wall height

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L = Length of geogrid measured from the front face of the Versa-Lok Square Foot retaining wall units.

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