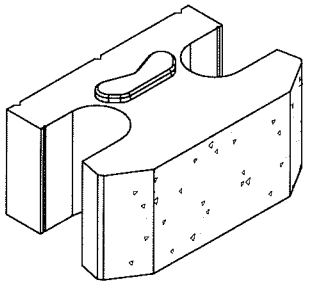
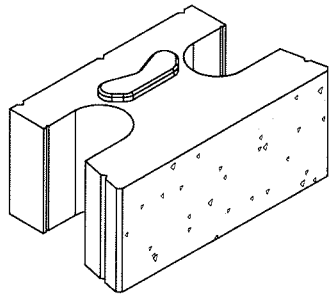
KEYSTONE HARDSCAPES®
WALL DESIGN/ESTIMATING

Valera™ Series
Retaining Wall Units



Tri-Plane Face Unit



Straight Face Unit

Note: Product availability, face finish, and dimensions vary by manufacturer. Please contact local Keystone product representative for availability.

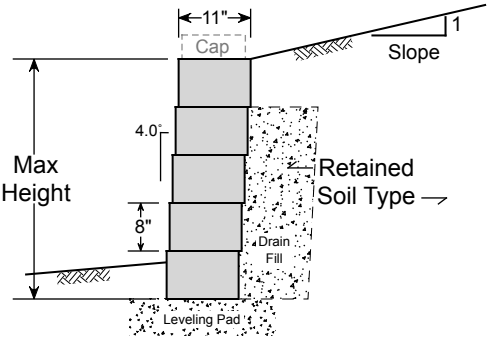
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A CONTECH COMPANY
4444 West 78th St, Minneapolis, MN 55127
www.keystonewalls.com

Project: VALERA UNITS		Title: DESIGN CHARTS
Designed By: cm	Date: 12/20/17	Scale: none
Checked By: cm	Revision:	Drawing No: Cover

KEYSTONE HARDSCAPES®
GRAVITY WALL DESIGN/ESTIMATING CHART
VALERA™ SERIES



TYPICAL GRAVITY WALL SECTION
4° Batter

	BACKSLOPE			
SOIL TYPE	**Level**	**4H:1V**	**3H:1V**	**2H:1V**
Sand/Gravel (ϕ=34° & ɣ=120 PCF)	2.67'	2.67'	2.00'	2.00'
Silty Sand (ϕ=30° & ɣ=120 PCF)	2.67'	2.00'	2.00'	1.33'
Silt/Lean Clay (ϕ=26° & ɣ=120 PCF)	2.00'	1.33'	1.33'	<1.0'
	MAXIMUM TOTAL HEIGHT			

GRAVITY WALL HEIGHT LIMITS
Valera Wall Units

NOTES:

- Wall design height is total top to bottom height excluding caps.
- Minimum wall embedment is 6 inches for reasonably level toe slope condition.
- Leveling pad is 6" thick crushed stone base.
- Analysis based on Coulomb earth pressure analysis per NCMA Design Manual, 3rd Ed.
- Assumed soil design properties shown in chart.
- No additional surcharges considered in design charts other than slopes listed.
- All backfill material to be compacted to 95% Standard Proctor Density.
- See wall construction manual and specifications for all details pertaining to wall design, drainage, and installation.

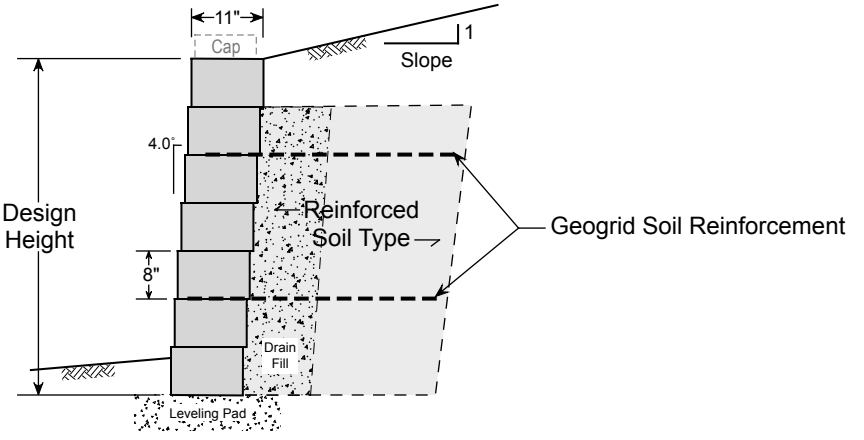
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Project: VALERA UNITS		Title: DESIGN CHARTS
Designed By: cm	Date: 12/20/17	Scale: none
Checked By: cm	Revision:	Drawing No: 1 of 5

KEYSTONE HARDSCAPES®
REINFORCED WALL DESIGN/ESTIMATING CHARTS
VALERA™ SERIES



TYPICAL REINFORCED WALL SECTION
4˚ Batter

NOTES:

- Wall design height is total top to bottom height excluding caps.
- Minimum wall embedment is 6 inches or 10% Height for reasonably level toe slope condition.
- Leveling pad is 6" thick crushed stone base.
- Analysis based on Coulomb earth pressure analysis per NCMA Design Manual, 3rd Ed.
- Assumed soil design properties shown in reinforcement charts.
  Soil properties assumed the same for reinforced, retained, and foundation zones.
- No surcharge (landscaping), 100 psf live load, and 3H:1V backslope conditions considered.
- Geogrid soil reinforcement long term design strength, LTDS = 1800 plf minimum.
- Reinforcement lengths provided are the full length of reinforcement in principal strength direction placed perpendicular to wall face.
- All backfill material to be compacted to 95% Standard Proctor Density.
- See wall construction manual and specifications for all details pertaining to wall design, drainage, and installation.
- Perform site specific engineering as required for any permit requirements.

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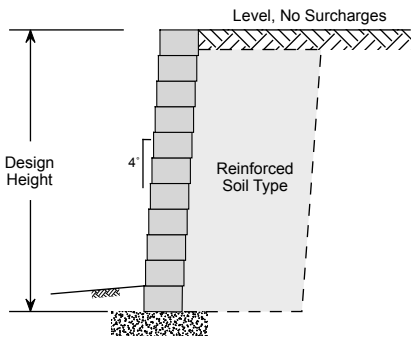
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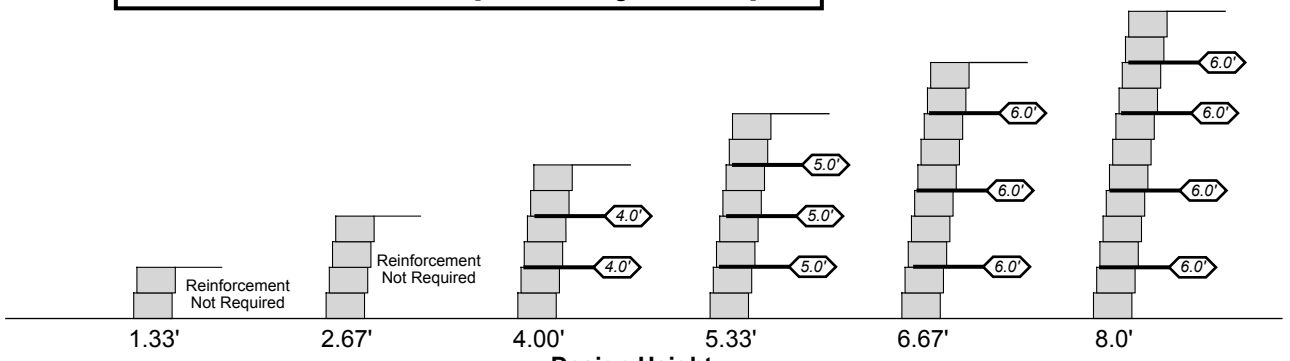
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Designed By: cm	Date: 12/20/17	Scale: none
Checked By: cm	Revision:	Drawing No: 2 of 5

Preliminary Design/Estimating Charts
Sand/Gravel Soil - ϕ = 34˚, ɣ = 120 pcf

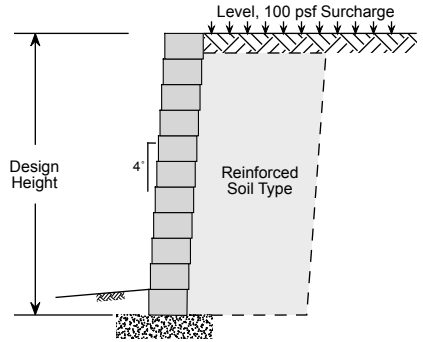
KEY
Soil Reinforcement Level & Length — 5.0'
Min. Reinforcement LTDS = 1800 plf

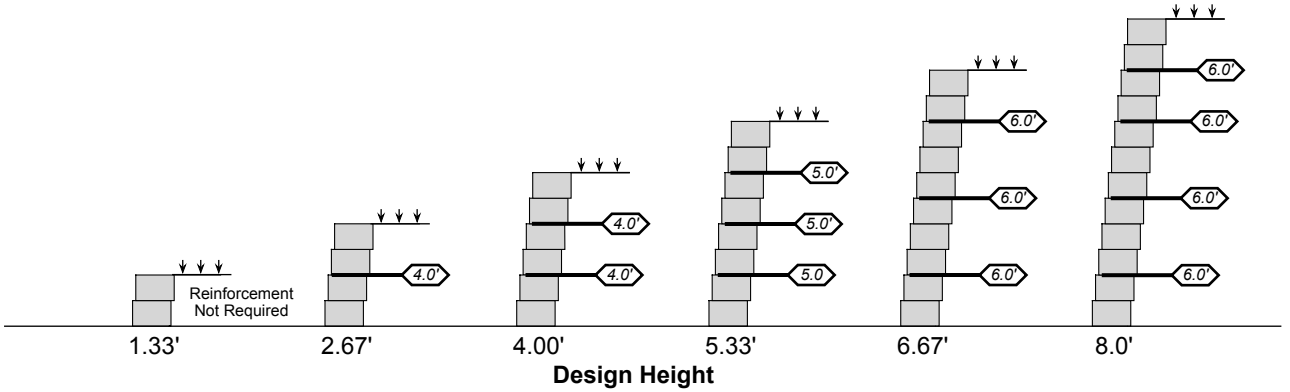
CASE I



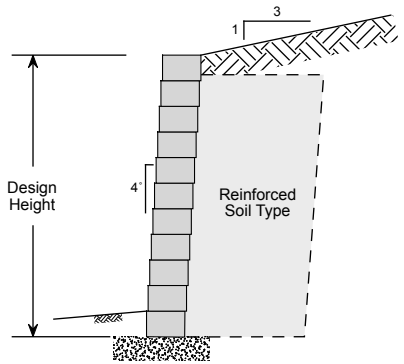


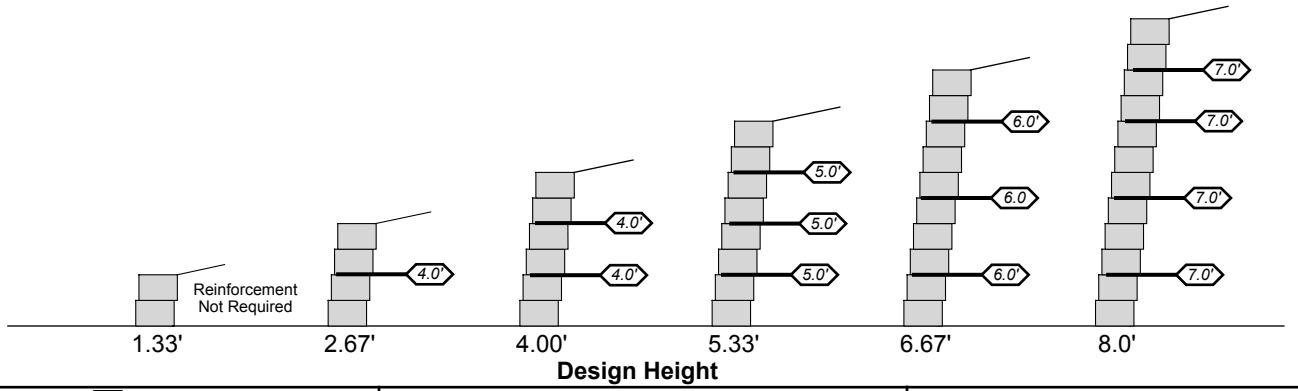
CASE II





CASE III





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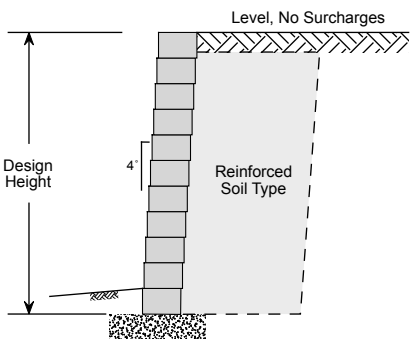
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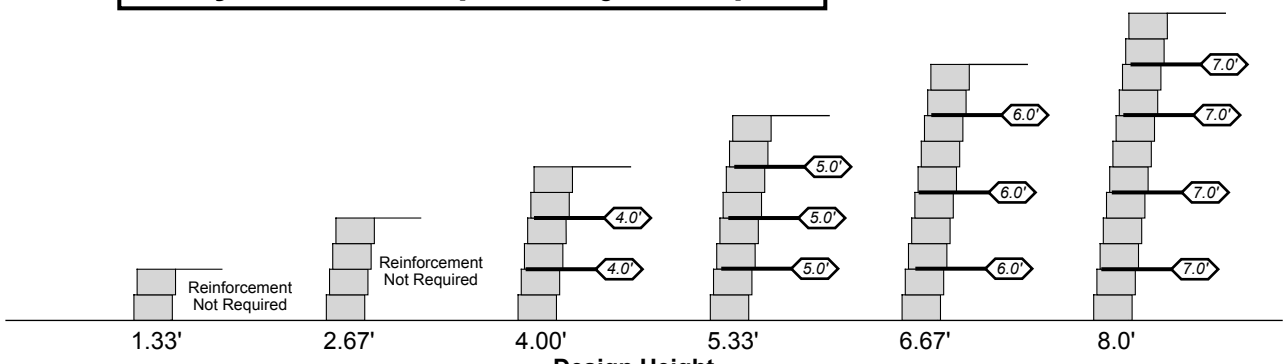
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Project:			Title:		
VALERA UNITS			DESIGN / ESTIMATING CHARTS		
Designed By:	Checked By:	Scale:	Revision:	Date:	Drawing No:
cm	cm	none		12/20/17	3 of 5

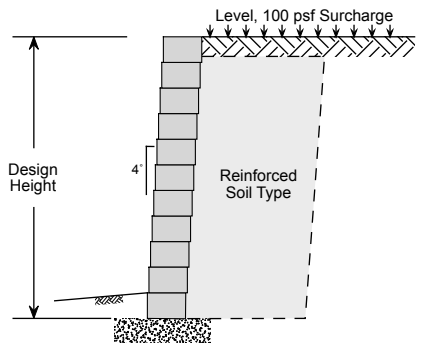
Preliminary Design/Estimating Charts
Silty Sand Soil - ϕ = 30˚, ɣ = 120 pcf

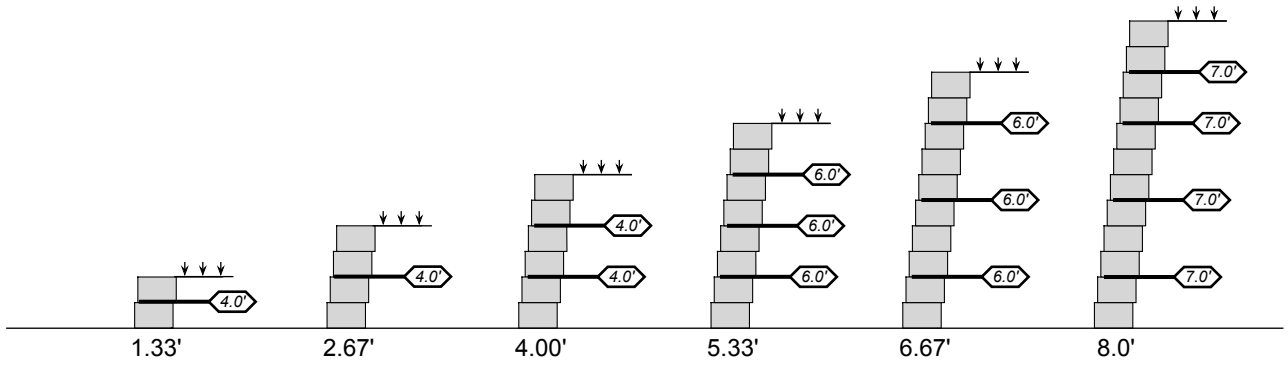
KEY
Soil Reinforcement Level & Length — 5.0'
Min. Reinforcement LTDS = 1800 plf



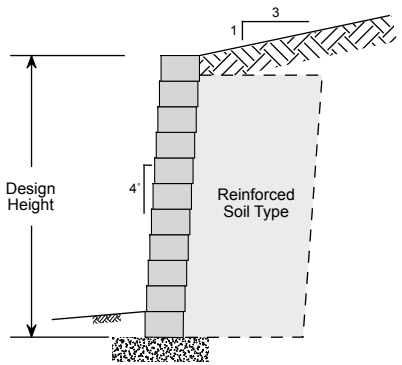


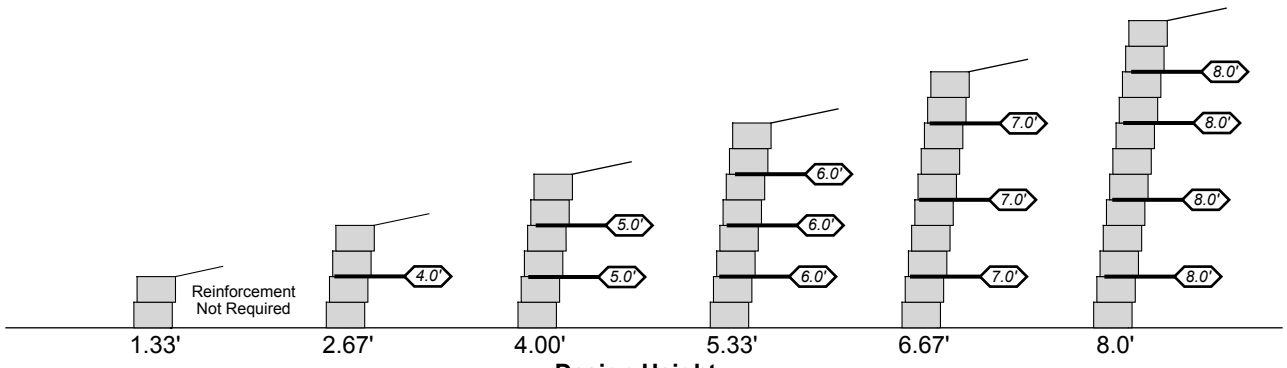
CASE I





CASE II





CASE III

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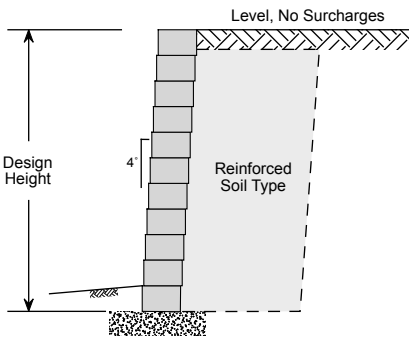
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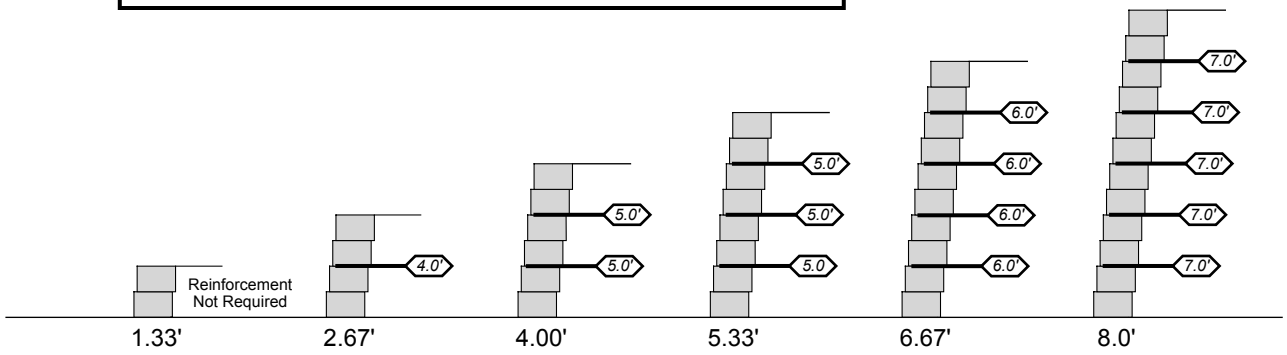
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VALERA UNITS			DESIGN / ESTIMATING CHARTS		
Designed By:	Checked By:	Scale:	Revision:	Date:	Drawing No:
cm	cm	none		12/20/17	4 of 5

Preliminary Design/Estimating Charts
Silt/Lean Clay Soil - ϕ = 26˚, ɣ = 120 pcf

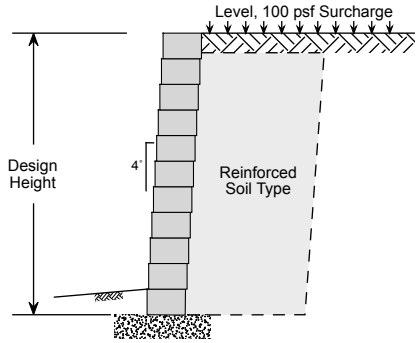
KEY
Soil Reinforcement Level & Length — 5.0'
Min. Reinforcement LTDS = 1800 plf

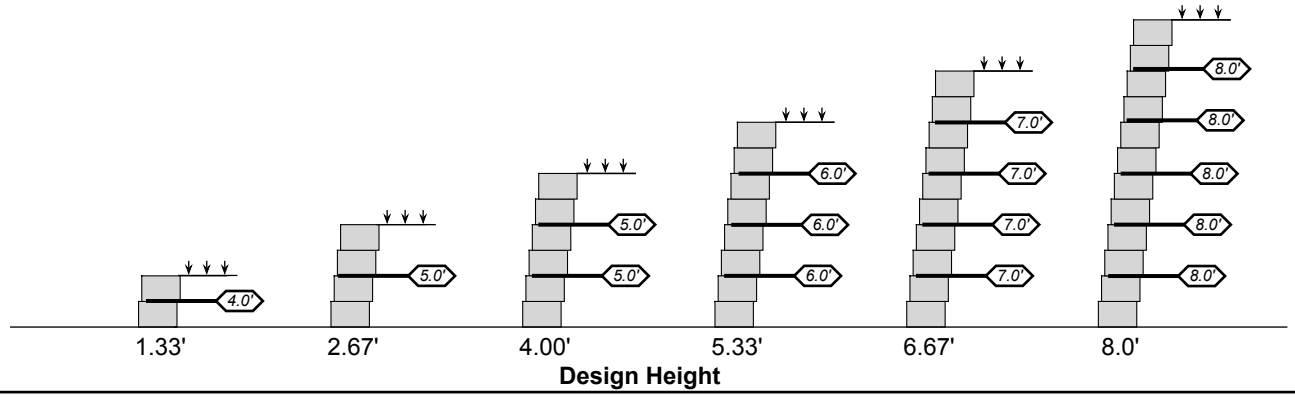
CASE I



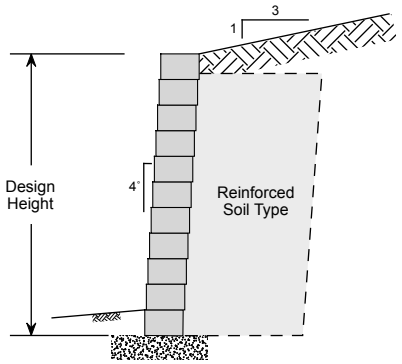


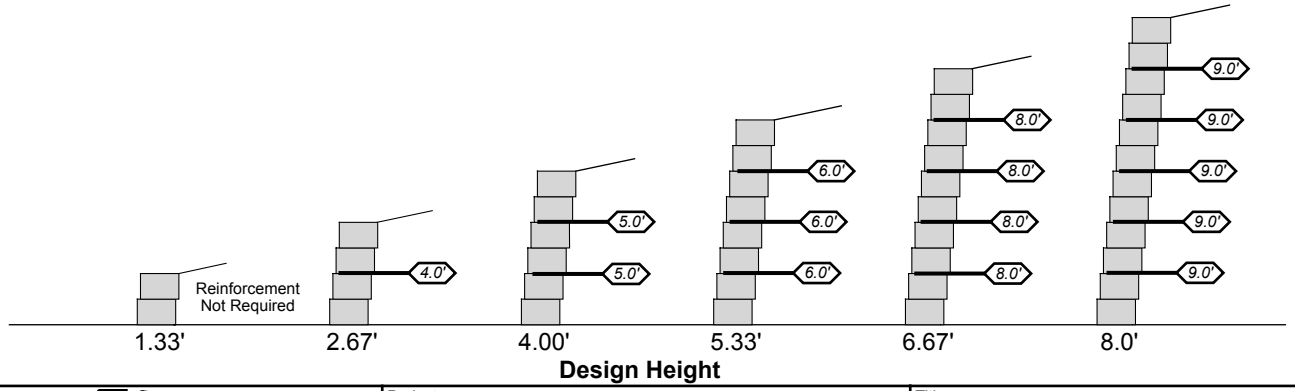
CASE II





CASE III





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Project:			Title:		
VALERA UNITS			DESIGN / ESTIMATING CHARTS		
Designed By:	Checked By:	Scale:	Revision:	Date:	Drawing No:
cm	cm	none		12/20/17	5 of 5