



Wall

Stem height(h)	12
foot.thick (c)	1.25
foot.embed.(b+c)	1.75
top stem thick(a)	0.6667
bot. stem thick(e)	1
toe exten.(d)	1
heel exten.(f)	8
backfill angle(Q)	14
Material.unit wt.(γ)	150

H 15.74357

Design values of μ based on US navy

clean sound rock	0.7
clean gravel,gravel-sand mixtures,coarse sand	0.55-0.60
clean fine-to-medium sand,silty medium-to-coarse sand,silty or clayey gravel	0.45-0.55
clean fine sand,silty or clayey fine to medium sand	0.35-0.45
fine sandy silt,nonplastic silt	0.30-0.35
very stiff and hard residual or overconsolidated clay	0.40-0.50
Medium stiff and stiff clay and silty clay	0.30-0.35

Backfill soil

Gh	32.60681
Gv	14.05722

Found.soil

allow. Bearing press	5000
allow. passive press	247.13
allow. Coefficient of	0.333646

Backfill soil

c'(effective cohesion)	0
Φ' (effec.fric.angle)	35
γ (unit wt.)	122
alpha(backwall angle)	0

coeff. Of fric. (μ)	0.5
Sliding safety F.	2
Safety for μ	1.5

Found.soil

c'(effective cohesion)	0
Φ' (effec.fric.angle)	38
γ (unit wt.)	125

Φ_w (fric.angle)	23.33333
coulomb's factor(a	0.671301
coulomb's factor(b	0.918298
coulomb's factor(c	2.511706

$k_a = a/b/c$	0.291048
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$G_h = \gamma K_a \cos \Phi_w$	32.60681
$G_v = \gamma K_a \sin \Phi_w$	14.05722

μ (coeff.of friction)	0.500468
$\mu_{all.}$	0.333646

$\lambda_{all.}$ (`allow.equiv.pas s.fluid dens.) (Kn/m^3)	247.13
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P_a/b	4040.963
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V_a/b	1742.112
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Weight on bc

Stem
Footing
Soil behind wall
 V_a/b

$\text{sum}(p/b + W_f/b)$

$V_f/b (= \text{sum} + .5 l_a d_a D)$

Fsliding

Sliding Criteria

Comment

ottom

1500.03

1875

12684.86

1742.112

17802

6317.978

1.563483

OK

good

Source	Force	mom.arm	Md/b	Mr/b
Pa/b	4040.963206937	5.24785715559526	21206.4	
Va/b	1742.111955365	10		17421.12
Stem	1500.03	1.5		2250.045
Footing	1875	5		9375
Soil behind	12684.86287579	6		76109.18
			21206.4	105155.3

Foverturn 4.95866122054789
safety factor for
overturn 2

Overturn Criteria OK

x 4.71570168211908
e 0.28429831788092
mid third 1.66666666666667

Loc.of
resultant(tension
check) Within middle third

B' 9.43140336423815
q equiv 1887.52449064554

Bearing Check OK

Pa/b	2347.691
Pu/b	3991.074
Mu/b	15979.25

Relationship b/n consistency of cohesive soils and undrain

	Undrained shear	
Consistency	strength(Kpa) Su	Visual Identification
Very soft	<12	Thumb can penetrate more than 25mm
soft	12 upto 25	Thumb can penetrate more about 25mm
medium	25 upto 50	Penetrated with thumb with moderate effort
stiff	50 upto100	Thumb will indent soil about 8mm
very stiff	100 upto200	Thumb will not indent,but readily indented with thumbnail
hard	>200	Indented by thumbnail with difficulty or can not indent with thumbnail

ied shear strength