FIRM:Your Firm JOB NO. SHEET NO: 1
MADE BY:KJH DATE:05-24-2006 CHECKED BY: DATE:
TITLE:Example SHORTPIL calculation

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SHORT PILE DESIGN:

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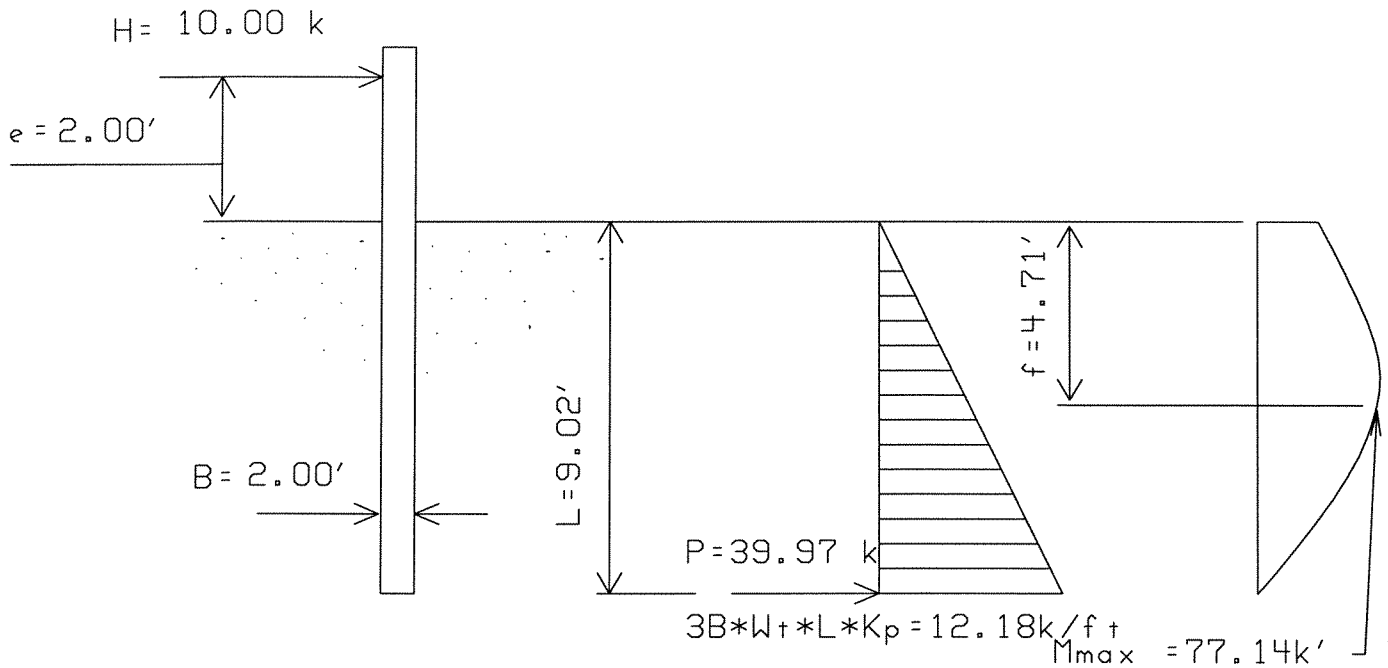


Design Data:

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Load factor design, LF= 1.50
Factored horizontal load, Hu=LF x H= 1.50 x 10.00 = 15.00
Soil strength reduction factor= .750

Theory is based on B. B. Broms method, published in the ASCE Journal of Soil Mechanics and Foundation Division, 1964 and 1965. The method is applicable to short piles with length/width ratio less than 10.

Type of soil: Sand
Sand unit weight, Wt= .100 kcf
Angle of internal friction, Phi= 30.000 degrees

$$\text{Rankine coefficient of passive pressure, } Kp=\frac{1+\sin(30.000)}{1-\sin(30.000)}= 2.999$$

Reduced Kp= .750 x 2.999 = 2.249

Moments about bottom must be zero. By trial, required embedment, L= 9.02'

$$Mbot=Hu*(e+L)-1/6*Pressure*L^2$$
$$= 15.00*(2.00 + 9.02) - 1/6*(12.18)*(9.02)^2$$
$$= 0.0 \text{ k'}$$

Zero shear occurs at f= 4.71' below grade
Pressure at f, p=3*B*Wt*f*Kp= 6.363 k/ft
Shear at f, V= 15.00 - 1/2*( 6.363)*( 4.71)=0 (checks)

Factored moment at f, $Mmax= 15.00*(2.00 + 4.71) - 1/6*(6.36)*(4.71)^2$
$= 77.1$ k'
Ratio= L/B = 9.02/ 2.00 = 4.51 < 10 (OK - method is valid)