

Subject: <u>STAIR</u>	Date: <u>6.15.10</u>
REA Project Name: <u>5th &amp; College</u>	Engineer: <u>DN</u>
REA Project Number: <u>10145</u>	Sheet Number: <u>1</u> of <u>3</u>

4 1/2' CUT

8' CUT

$p_a = 35$  PCF GEOPACIFIC

$p_p = 390$  ULTIMATE GEOPACIFIC

$\div 1.5 = 260$  PCF

OVER 2  $\phi$  GEOPACIFIC

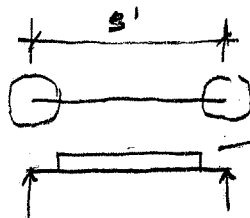
$p_p \text{ net} \geq 260 - 35 = 225$

$F_y = 50$

4 1/2' WALK  $M = 32.5$  <sup>1k</sup> W10x22 OK FOR  $M = 32.5$  @  $L_u = 13'$  OK.

8' WALK  $M = 102.9$  <sup>1k</sup> W12x40 OK FOR  $M = 103$  @  $L_u = 14'$   
W10x45 OK FOR  $M = 103$  @  $L_u = 19'$

LOADING



$W = 35 \times (8+2) = 350$  USE HALF LOADS

$M = \frac{350}{2} \times \frac{8^2}{8} = 1400$

$3 \times 12 \quad S = \frac{1}{6} (12) (8)^2 = 128 \quad S_b = \frac{12 \times 12}{12} = 933$   
OK

SUBMITTAL NO. 310000-02  
REVIEWED BY S D DEACON CORP.  
BY: [Signature] DATE: 6/16/10

This check does not in any way relieve the Subcontractor or Supplier of their responsibility to verify accuracy of details, quantities, and dimensions



EXPIRATION DATE: 12/31/10

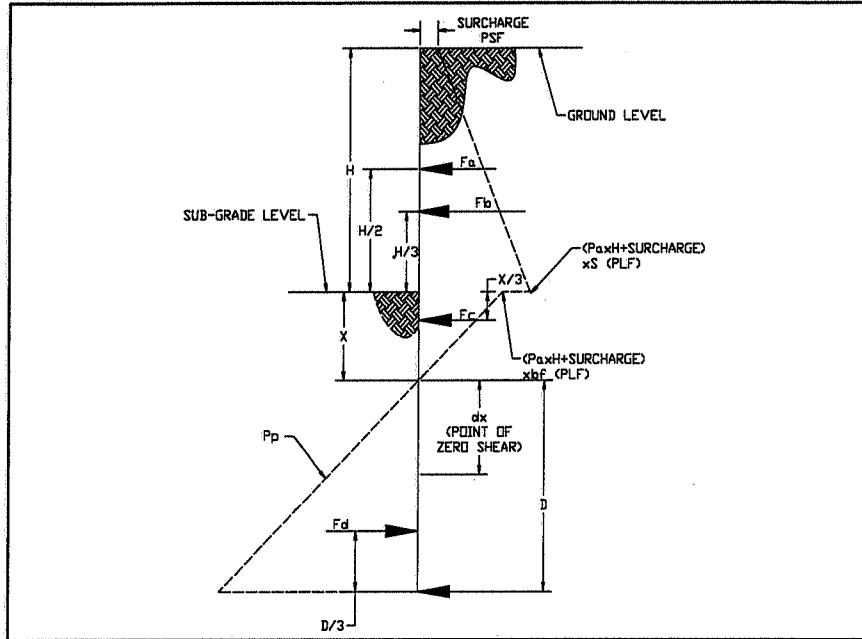
CALCULATION  
SHEETS  
1/3 THEN 3/3

**Cantilevered  
Pile  
Design**

Client: St. College  
Job #: 10145  
Title: SHORELINE  
Date: 6.15.10  
Engineer: DN

2/3

H=	5	ft
Surcharge=	70	psf
D=	8	ft
Pa=	35	pcf
Pp(net)=	225	pcf
S=	8	ft
bf=	2	ft
bf factor=	2	(bff)
Fyb=	50	ksi



$$X = ((Pa \times H + \text{Surch.}) \times bf) / (Pp(\text{net}) \times bff \times bf) =$$

0.54 ft

Overturning Moment (about base):

	Force (lb)	Arm (ft)	Moment (ft-lb)
Fa=Surch x H x S=	2800	11.0	30924
Fb=(Pa x H <sup>2</sup> x S) / 2=	3500	10.2	35739
Fc=(Pa x H + Surch) x bf x (X/2)=	133	8.4	1116
			<u>67779</u>

Restoring Moment (about base):

Fd=Pp(net) x (D) <sup>2</sup> x bff x bf/2=	28800	2.7	76800
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$$RM/OTM = 1.13 \quad \text{OK}$$

$$\text{Req'd Embedment} = X + 1.2 \times D = \underline{\underline{10.14 \text{ ft}}}$$

$$\text{Total Length} = \underline{\underline{15 \text{ ft.}}}$$

Stresses in Pile:

$$V=0 \text{ when } (Fa+Fb+Fc) = Pp(\text{net}) \times (dx) \times bff \times bf \times (dx)/2 \quad \rightarrow V=0 \text{ @ } dx = 3.8 \text{ ft}$$

$$M_{\text{max}} = 32.5 \text{ ft-k} = 390.3 \text{ in-k}$$

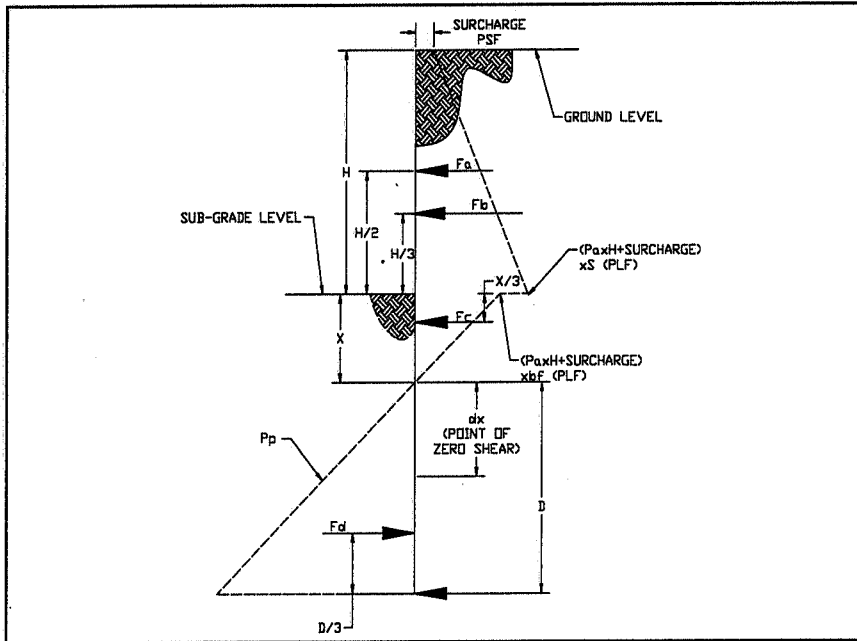
$$\text{Sreq} = M / (.66 \times Fyb) = \underline{\underline{11.8 \text{ in}^3}} \quad M / (.66 \times 1.25 \times Fyb) = \underline{\underline{9.5}}$$

**Cantilevered  
Pile  
Design**

Client: S & College  
 Job #: 1014  
 Title: SHANMS  
 Date: 6.15.10  
 Engineer: DA

3/3

H=	8	ft
Surcharge=	70	psf
D=	12	ft
Pa=	35	pcf
Pp(net)=	225	pcf
S=	8	ft
bf=	2	ft
bf factor=	2	(bff)
Fyb=	50	ksi



$X = ((Pa \times H + \text{Surch.}) \times bf) / (Pp(\text{net}) \times bff \times bf) = 0.78 \text{ ft}$

Overturning Moment (about base):

	Force (lb)	Arm (ft)	Moment (ft-lb)
$Fa = \text{Surch} \times H \times S =$	4480	16.8	75164
$Fb = (Pa \times H^2 \times S) / 2 =$	8960	15.4	138382
$Fc = (Pa \times H + \text{Surch}) \times bf \times (X/2) =$	272	12.5	3408
			<u>216954</u>

Restoring Moment (about base):

$Fd = Pp(\text{net}) \times (D)^2 \times bff \times bf / 2 =$	64800	4.0	259200
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$RM/OTM = 1.19 \text{ OK}$

Req'd Embedment =  $X + 1.2 \times D = \underline{15.18 \text{ ft}}$       Total Length = 23 ft.

Stresses in Pile:

$V=0 \text{ when } (Fa + Fb + Fc) = Pp(\text{net}) \times (dx) \times bff \times bf \times (dx) / 2 \rightarrow V=0 \text{ @ } dx = 5.5 \text{ ft}$

$M_{\text{max}} = 102.9 \text{ ft-k} = 1234.4 \text{ in-k}$   
 $\text{Sreq} = M / (.66 \times Fyb) = \underline{37.4 \text{ in}^3}$        $M / (.66 \times 1.25 \times Fyb) = \underline{29.9}$