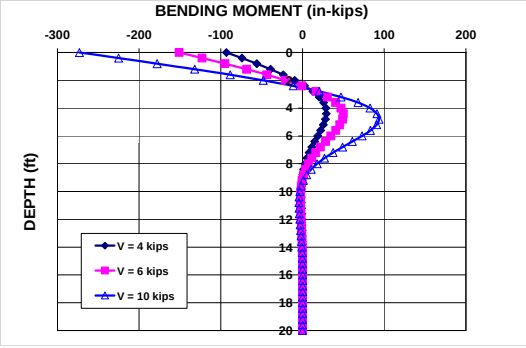
LPILE Analysis Results – 200 Kip Micropile



Solution

- Combined Stress Check

$$\frac{P_c}{P_{c-allowable}} + \frac{M_{max}}{M_{allowable}} \le 1.0$$

$P_c = 200\,kips\,(see\,WP\,No.2)$

$P_{c-allowable} = 276\,kips\,(see\,WP\,No.2)$

$M_{allowable} = F_b \times S$

$F_b = 0.55 F_y = 0.55(80\,ksi) = 44\,ksi$

$S = I/(OD/2)$

$I = \frac{\pi}{64}(OD^4 - ID^4) = \frac{\pi}{64}(5.5^4\,in.^4 - 4.67^4\,in.^4) = 21.57\,in^4$

$S = 21.57\,in^4/(5.5\,in./2) = 7.84\,in^3$

$M_{allowable} = 44\,ksi \times 7.84\,in^3 = 345\,in-kips$

Solution

$M_{max} = 273\,in.-kips\ (\ for\ S = 10\,kips)$

$\frac{200\,kips}{276\,kips} + \frac{273\,in.-kips}{345\,in.-kips} = 1.52\ \ No\,Good$

This result indicates that a 10 kip shear load will overstress the micropile.

$M_{max} = \left(1 - \frac{P_c}{P_{c-allowable}}\right) \times M_{allowable}$

$M_{max} = \left(1 - \frac{200\,kips}{276\,kips}\right) \times 345\,in.-kips = 95\,in.-kips$

∴ Maximum Shear Load = 4 kips (see Bending Moment Diagram)