

Job No: 180132  
Job Name: Herbert Road, Newport

Rev:  
Design Engineer: AH

Date: 01/11/2018

Page: 5

**APPENDIX A**  
**SET CALC PM16**

# Calculation Sheet

Reference

Contract



Output

## Negative Skin Friction Calculation

**Strata 1 = Made Ground**

**0 to 5.2 m below cut-off level**

$$\rho\theta' = 5.2 \text{ m} \times 16.0 \text{ kN/m}^2 = 83.2 \text{ kN/m}^2$$

$$\text{TNSF} = 0.25 \times 83.2 \text{ kN/m}^2 = 20.8 \text{ kN/m}^2$$

**Strata 2 = PEAT**

**5.2 to 10.3 m below cut-off level**

$$\rho\theta' = 5.1 \text{ m} \times 12.0 + 83.2 \text{ kN/m}^2 = 144 \text{ kN/m}^2$$

$$\text{TNSF} = 0.25 \times 144.4 = 36.1 \text{ kN/m}^2$$

$$\text{TOTAL NSF} = n \times \text{pile dia.} \times \sum_{i=2}^{i=1} \left( \left[ \frac{\tau_{\text{NSF } i-1} + \tau_{\text{NSF } i}}{2} \right] \times l_i \right)$$

$$\text{TOTAL NSF} = n \times 0.20 \times 199.2$$

$$\text{TOTAL NSF} = 125 \text{ kN}$$

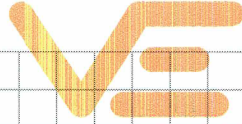
# Calculation Sheet

Reference	Contract	Output
	180132 Herbert Road, Newport	
	PILE SIZE RIG TYPE	Precast Concrete Driven Piles - 200mm Junttan PM16
	Maximum Pile Load	350 kN
	Factor of Safety	2.50
	Hammer Weight	40 kN
	Drop height	400 mm
	Efficiency %	100 %
	NSF	250 kN (ULT) F.O.S 2.0
	from top 10m (ignored)	
	<b><u>BASED UPON THE MODIFIED HILEY FORMULA</u></b>	
	which states	
	$R_u = \frac{E}{S+C/2} \quad \text{and thus,} \quad S = \frac{E}{R_u} - \frac{C}{2}$	
	where,	Ru = Ultimate Load Incorporating Factor of Safety (kN) E = Actual Transferred Energy from Hammer (kNmm) C = Total Temporary Compression of Pile and Ground (mm) S = Set per Blow (mm)
	hence,	$R_u = \frac{350 \text{ kN} \times 2.50}{1.00} = 875 + 250 = 1125 \text{ kN}$ $E = 40 \text{ kN} \times 400 \text{ mm} = 16000 \text{ kNmm}$ $C = 10 \text{ mm (to be measured on site)}$
	Therefore	$S = \frac{16000}{1125} - \frac{10}{2} = 9.22 \text{ mm/Blow}$
		Therefore, Set for 10 Blows to achieve 350 kN = 92 mm
		and thus, Set for 10 Blows to achieve 325 kN = 100 mm
		and thus, Set for 10 Blows to achieve 300 kN = 110 mm
		and thus, Set for 10 Blows to achieve 275 kN = 120 mm
		and thus, Set for 10 Blows to achieve 250 kN = 132 mm
		and thus, Set for 10 Blows to achieve 225 kN = 146 mm
		and thus, Set for 10 Blows to achieve 200 kN = 163 mm
		and thus, Set for 10 Blows to achieve 175 kN = 182 mm

# Calculation Sheet

Reference

Contract



**VAN ELLE**  
 TOTAL FOUNDATION SOLUTIONS

Output

## Negative Skin Friction Calculation

**Strata 1 = Made Ground**

**0 to 5.2 m below cut-off level**

$$\rho_0' = 5.2 \text{ m} \times 16.0 \text{ kN/m}^2 = 83.2 \text{ kN/m}^2$$

$$\text{TNSF} = 0.25 \times 83.2 \text{ kN/m}^2 = 20.8 \text{ kN/m}^2$$

**Strata 2 = PEAT**

**5.2 to 10.3 m below cut-off level**

$$\rho_0' = 5.1 \text{ m} \times 12.0 + 83.2 \text{ kN/m}^2 = 144 \text{ kN/m}^2$$

$$\text{TNSF} = 0.25 \times 144.4 = 36.1 \text{ kN/m}^2$$

$$\text{TOTAL NSF} = n \times \text{pile dia.} \times \sum_{i=2}^{i=1} \left( \left[ \frac{\tau_{\text{NSF } i-1} + \tau_{\text{NSF } i}}{2} \right] \times l_i \right)$$

$$\text{TOTAL NSF} = n \times 0.25 \times 199.2$$

$$\text{TOTAL NSF} = 156 \text{ kN}$$