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Eastern Office Tel: 01362 697097
Smartfoot Office Tel: 01773 580580
Northern Office Tel: 0191 4178332

VAN ELLE
TOTAL FOUNDATION SOLUTIONS

QAP 4A/2
Calculation Sheet No 9
Date: 1-11-18
Job No: 180132
Calcs By: AH
Review By:

Calculation Sheet

Reference	Contract	Output

180132 Herbert Road, Newport

PILE SIZE — Precast Concrete Driven Piles - 250mm
RIG TYPE — **Junttan PM16**

Maximum Pile Load	600	kN	
Factor of Safety	2.50		
Hammer Weight	40	kN	
Drop height	400	mm	
Efficiency %	100	%	
NSF	312	kN	(ULT) F.O.S 2.0

from top 10m (ignored)

BASED UPON THE MODIFIED HILEY FORMULA

which states

$$Ru = \frac{E}{S + C/2} \quad \text{and thus,} \quad S = \frac{E}{Ru} - \frac{C}{2}$$

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,
Ru = 600 kN x 2.50 = 1500 + 312 = 1812 kN
E = 40 kN x 400 mm 1.00 = 16000 kNmm
C = 10 mm (to be measured on site)

Therefore

$$S = \frac{16000}{1812} - \frac{10}{2} \qquad S = 3.83 \text{ mm/Blow}$$

Therefore, Set for 10 Blows to achieve	600 kN =	38 mm
and thus, Set for 10 Blows to achieve	575 kN =	41 mm
and thus, Set for 10 Blows to achieve	550 kN =	44 mm
and thus, Set for 10 Blows to achieve	525 kN =	48 mm
and thus, Set for 10 Blows to achieve	500 kN =	52 mm
and thus, Set for 10 Blows to achieve	475 kN =	56 mm
and thus, Set for 10 Blows to achieve	450 kN =	61 mm
and thus, Set for 10 Blows to achieve	425 kN =	66 mm
and thus, Set for 10 Blows to achieve	400 kN =	71 mm
and thus, Set for 10 Blows to achieve	375 kN =	78 mm
and thus, Set for 10 Blows to achieve	350 kN =	84 mm
and thus, Set for 10 Blows to achieve	325 kN =	92 mm

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VAN ELLE
TOTAL FOUNDATION SOLUTIONS

QAP 4A/2
Calculation Sheet No 10
Date: 1-11-18
Job No: 180132
Calcs By: A H
Review By:

Calculation Sheet

Reference	Contract	Output

VAN ELLE
TOTAL FOUNDATION SOLUTIONS

Negative Skin Friction Calculation

Strata 1 = Made Ground **0 to 5.2 m below cut-off level**

ρ0′	=	5.2 m	x	16.0 kN/m³	=	83.2 kN/m²	
TNSF	=	0.25	x	83.2 kN/m²	=	20.8 kN/m²	

Strata 2 = PEAT **5.2 to 10.3 m below cut-off level**

ρ0′	=	5.1 m	x	12.0	+	83.2 kN/m²	=	144 kN/m²
TNSF	=	0.25	x	144.4	=	36.1 kN/m²		

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

TOTAL NSF = π x 0.30 x 199.2

TOTAL NSF = 188 kN

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VAN ELLE
TOTAL FOUNDATION SOLUTIONS

QAP 4A/2
Calculation Sheet No 11
Date: 1-11-18
Job No: 180132
Calcs By: AH
Review By:

Calculation Sheet

Reference | **Contract** 180132 Herbert Road, Newport | **Output**

PILE SIZE Precast Concrete Driven Piles - 300mm
RIG TYPE **Junttan PM16**

Maximum Pile Load	800 kN		
Factor of Safety	2.50		
Hammer Weight	40 kN		
Drop height	400 mm		
Efficiency %	100 %		
NSF	376 kN	(ULT)	F.O.S 2.0

from top 10m (ignored)

BASED UPON THE MODIFIED HILEY FORMULA

which states

$$Ru = \frac{E}{S+C/2} \quad \text{and thus,} \quad S = \frac{E}{Ru} - \frac{C}{2}$$

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,
Ru = 800 kN x 2.50 = 2000 + 376 = 2376 kN
E = 40 kN x 400 mm 1.00 = 16000 kNmm
C = 10 mm (to be measured on site)

Therefore

$$S = \frac{16000}{2376} - \frac{10}{2} \qquad S = 1.73 \text{ mm/Blow}$$

Therefore, Set for 10 Blows to achieve	800 kN =	17 mm
and thus, Set for 10 Blows to achieve	775 kN =	19 mm
and thus, Set for 10 Blows to achieve	750 kN =	21 mm
and thus, Set for 10 Blows to achieve	725 kN =	23 mm
and thus, Set for 10 Blows to achieve	700 kN =	25 mm
and thus, Set for 10 Blows to achieve	675 kN =	27 mm
and thus, Set for 10 Blows to achieve	650 kN =	29 mm
and thus, Set for 10 Blows to achieve	625 kN =	32 mm
and thus, Set for 10 Blows to achieve	600 kN =	35 mm
and thus, Set for 10 Blows to achieve	575 kN =	38 mm
and thus, Set for 10 Blows to achieve	550 kN =	41 mm
and thus, Set for 10 Blows to achieve	525 kN =	44 mm