

ALPHA FENCE

24/09/2019

POST SECTION & POST FOUNDATION CALCULATING TEMPLATE

Client Name	Barratt Homes
Project name	Felpham
Selected Fence Post Section	100x50x3.5 RHS 43C
Post Section Weight	7.61 kg/m
Total Post Length	5,700 mm
Total Post Weight	50 kg
Top Deflection (65% of Permitted)	73 mm
Post Stress (62% of Permitted)	139 N/mm ²

OK
OK

Top of Fence Height (H)	5000 mm
Cladding/Infil Vertical Width	5000 mm
Fence Cladding/Infil Description	Football/Rugby Netting (120 x 120 x 2.5)
Basic Description of Infil Type	Round Wire/Mesh Infil
Fence Post Spacing	5000 mm
HORIZONTAL Round Wire/Mesh Infil Spacing	120 mm
VERTICAL Round Wire/Mesh Infil Spacing	120 mm
HORIZONTAL Round Wire/Mesh Infil Thickness	2.5 mm
VERTICAL Round Wire/Mesh Infil Thickness	2.5 mm
Number of Linewires	5 no
Linewire Centres	1250 mm
ROUND WIRE/MESH INFIL SOLIDITY	4.1%
Assessed Ground Composition	UNKNOWN Ground Conditions
UNKNOWN Ground Conditions Ground Pressure Factor	100 KN/m ²
Ground Conditions (Known, Unknown or Assessed)	Unknown
Safety factor: 1.2 if GBC Known, 1.5 if Assessed (PD 6547)	0.0
Unknown Ground Pressure Factor (with Safety)	100 KN/m ²
Windloading Calculations Standard Used	BS6399 Part 2
Dynamic Wind Pressure	679 N/m ²
Include Personnel Load Factor	Yes
Personnel/Crowd Load (Using BS6399) P	714 N
Height of Personnel/Crowd Load Point (*) a	1,200 mm

WIND FORCE

Dynamic Wind Pressure	679 N/m ²
Net Pressure/Drag Co-Efficient Cp	1.20 Using BS6399
Round Wire/Mesh Infil Solidity	4.1%
Round Wire/Mesh Infil Panel Area (without post)	24.75 m ²
TOTAL WIND FORCE ON PANEL	831 N
Post Face Width	50 mm
Post Face Area	0.25 m ²
TOTAL WIND FORCE ON POST FACE	170 N
TOTAL WIND FORCE ON PANEL-POST COMBINED (W)	1,001 N
Max Wind Force before Post Failure	1,622 N
Total Wind Force must less than 1,622 N	OK 62% of Permitted

OVERTURNING MOMENT AT POST BASE

Fence Cladding (Centre) Height Above Ground	2,500 mm
TOTAL WIND FORCE ON PANEL & POST SYSTEM W	1,001 N
Personnel Load Moment	857 Nm
Wind Load Moment	2,501 Nm
OVERTURNING MOMENT AT GROUND LEVEL	3,358 Nm
Max O/T Moment before Post Failure	5,445 Nm
O/T Moment must less than 5,445 Nm	OK 62% of Permitted

STRESS AT POST BASE

Young's Modulus of Elasticity E	205,000 N/mm ²
Tensile Strength fy	270.0 N/mm ²
Safety Factor	1.5
Max. Permitted Yield Strength adjusted with safety factor fy	225 N/mm ²
Fence Post Elastic Modulus (Side)	24.2 Wel, xx Zxx (cm ³)
Personnel load Stress σ	35 N/mm ²
Wind Load Stress σ	103 N/mm ²
MAXIMUM STRESS AT POST BASE σ	139 N/mm ²
Stress must be less than 225 N/mm ²	OK 62% of Permitted

DEFLECTION

Fence Post Moment of Inertia (Side) I	121.0 bx (cm ⁴)
DEFLECTION AT POST TOP DUE TO PERSONNEL LOAD δ	10 mm
DEFLECTION AT POST TOP DUE TO WIND δ	63 mm
TOTAL DEFLECTION AT (5000 mm) POST TOP δ	73 mm
Total Max. Deflection at Point of Post Failure (Stress >=225 N/mm ²)	112 mm
Deflection must be less than 112 mm	OK 65% of Permitted

POST FOUNDATION

Assessed Ground Composition (see Control tables)	UNKNOWN Ground Conditions
Unknown Ground Bearing Capacity	100 KN/m ²
Width/Square of Hole B	0.300 m
Mass Concrete Depth D	0.509 m
Concrete Depth top to Zero/Pivot Point (0.68D) A	0.346 m
Concrete Width B	0.300 m
Concrete Depth to Upper Force Point (Q1) Above Pivot(A/2) C	0.173 m
Concrete Depth to Lower Force Point (Q2) Below Pivot (0.22D) E	0.112 m
Depth Below Pivot Point (0.32D) F	0.163 m
Total Wind & Personnel Force on Post (at centre of infil) P	1,001 N
Height from ground to Centre of Infil/Force (HEIGHT/2) H	2,500 m
Mass Concrete Needed to Resist Overturning	
$(S1*B*D^2)-(2.37*P*D)-(2.64*P*H)=0$	0 Zero if correct
Depth D= $((2.37*P)+SQRT(((2.37*P)^2)+(4*2.64*P*H*S1*B)))/(2*S1*B)$	0.509 m
Additional Depth Safety Factor (if required)	1.0 N/A
Adjusted with Safety Factor of 1.0	0.509 m
CONCRETE DEPTH ROUNDED UP TO NEAREST 50 mm	550 mm
DEPTH OF LOOSE/DAMAGED SOIL AT TOP OF HOLE	150 mm
Depth of Mass Concrete Below Ground Level	
DEPTH OF POST FOUNDATION HOLE	700 mm
LENGTH OF POST FOUNDATION	300 mm
WIDTH OF POST FOUNDATION	300 mm
DEPTH OF CONCRETE FILL	550 mm
CONCRETE VOLUME PER HOLE	0.050 m ³
EARTH VOLUME (BULKED x 1.2) PER HOLE	0.076 m ³

SHEAR

Shear Load due to Personnel Load	0.7 kN
Shear load due to Wind	1.0 kN
HORIZONTAL SHEAR LOAD AT GROUND LEVEL	1.7 kN

LINEWIRES

Number of Linewires	5 no.
Specification and Diameter of Linewires	5 mm dia. 7x7 wsc
Maximum Breaking Load of Linewire	15,212 N
Max Length between Straining Posts	50 metres
Max. Force Per Linewire (50 metre run)	2,077 N

