

Chain Link Fence: Line Post Calculator

Wind Analysis Method	Design Wind Loads - Solid Free Standing Walls	ASCE 7-10 Sec. 29.4
Basic Wind Speed (ultimate)	135.00 MPH	Risk Category I Structure
Topography Factor	Kzt = 1.00	ASCE 7-10 Fig. 26.8-1
Directionality Factor	Kd = 0.85	ASCE 7-10 Fig. 26.6-1
Gust Effect Factor	G = 0.85	ASCE 7-10 Sec. 26.9.1
Fence Height	h = 10.00 ft	$\alpha = 7$
Terrain Exp. Category	B	zg = 1200
Velocity Pressure Exp. Coefficient	Kz = 0.575	ASCE 7-10 Fig. 29.4-1
Fence Length (min. straight run)	B = 14.00 ft	B/h = 1.4
Line Post Spacing	S = 9.00 ft	Cf = 1.43
Mesh Size	1.75 in	Privacy Slats: NO
Wire Size (O.D)	#9 gage	

Velocity Pressure (strength)	qz = 22.79 psf	$qz = .00256KzKztKdV^2$
	qasd = 13.68 psf	$q_{asd} = 0.6qz$
Fence Trib. Area per Post (normal to wind)	Atrib = 90.00 ft ²	
Force on Post (ASD)	P = 1,496 lbs	$P = q_{asd}GC_fA_{trib}$ (Solid Wall)
Wind Load Factor	1/Cf1 = 0.156	
Adj. Force on Post (ASD)	P' = 234 lbs	$P' = P/C_{f1}$ (Perf Wall)
Height of Resultant Force	c = 5.50 ft	ASCE 7-10 Fig. 29.4-1
Overturning Moment at Grade	M = 1,286 ft-lbs	

Steel Post Calculations:

Steel Post Type	Group 1A Grade 30 ASTM F1083 Schedule 40 Steel Pipe Regular Grade (30,000 psi)		
Post Diameter	2.875 in		
Safety Factor	1.67 (1.5 - 1.67 typ.)		
Section Modulus	Sx = 1.064 in ³	Yield Strength	Fy = 30,000 psi
Allowable Moment	Mallow = 1,593 ft-lbs	→	OK

Specification: Use 2-7/8" Dia. Sch. 40 (30,000 PSI) Steel Line Posts @ 9' spacing

Footing Calculations:

(Constrained Footing)

Footing Diameter	b = 12.0 in	$d = \sqrt[3]{\frac{4.25M}{S'b}}$
Allowable Lateral Soil Bearing Pressure (S)	200 psf/ft	
Lateral Adj. Factors (per IBC Section 1806.3)	1.00	
Adj. Allowable Lateral Soil Bearing Pressure (S')	200.0 psf/ft	IBC Eqn. 18-2
Depth of Constrained Footing	d = 3.01 ft	

Footing Calculations:

(Non-Constrained Footing)

Allowable Lateral Soil Bearing Pressure @ 1/3 depth (S1)	A = 293 psf	$A = \frac{2.34P}{S_1b}$
	1.86	
Depth of Non-Constrained Footing	d = 4.40 ft	
		$d = 0.5A \left\{ 1 + \left[1 + \left(\frac{4.36c}{A} \right)^2 \right]^{1/2} \right\}$
Minimum footing depth per ATM F-567:	d = 42.00 in	IBC Eqn. 18-1
Minimum footing diameter (4x post dia.)	bmin = 11.50 in	→ OK ASTM F567

Specification: Use 12" Dia. X 42" Constrained Footing