



MAT POUR LAMPADAIRE SOLAIRE 5M

NOTE DE CALCUL ET DE RESISTANCE

NOTICE TECHNIQUE DE CALCUL ET DE RESISTANCE DU MAT 5M00

EN40 design of steel poles for street lighting compliant to EN 40-3-1 and EN 40-3-3 rules
Norme EN40 (En 40-3-1 et En 40-3-3) du mât 5M00 pour lampadaire solaire 5M :

1) Pole data

Total height $H_{tot} = 5000$ mm

1.1) Pole

Pole height $H_{fusto} = 4500$ mm

pole construction **Stepped**

Section	Lenght
Section 1	102x 3 4500

1.2) Configuration

Type **Pole Tip**

1.3) Fixture

Weight	$Q_t = 436$	N
horizontal displacement	$dg_x = 10$	mm
vertical displacement	$dg_z = 100$	mm
Wind area X	$A_X = 0,15$	m ²
Wind Area y	$A_Y = 0,23$	m ²
Pressure ratio	$C_p = 1$	

1.4) Cable slot

Dimension axb	NA	
Height from ground	$h_a = ---$	mm

1.5) Material

Yield strenght	$f_y = 235$	N/mm ²
E Modulus	$E = 206000$	N/mm ²
T Modulus	$G = 80000$	N/mm ²
Specific weight	$\gamma = 78500$	N/m ³

2) Design parameters





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2.1) Safety ratios

Material	$\gamma_M =$	1,05
Vertical loads	$\gamma_{L,G} =$	1,2
Wind load	$\gamma_{L,W} =$	1,4
Resistance class		A

2.2) Wind Action

EN40-3-1 Parameters

Vref	$v_{ref,10} =$	34	m/sec
Terrain		I	
Topography ratio	$C_t =$	1	
T		25	years

Wind velocity at 10 m above ground= 50.04 m/sec, referred to a pression $q(10)*C_e$, 10 mt above ground

3) Design Results

3.1) Dynamic behaviour

To	$T_0 =$	0,6192	sec
Dynamic amplification ratio		1,2637	

3.2) Deflection test

Max vertical deflection	$f_v =$	0,02	mm
Max horizontal deflection	$f_x =$	113,34	mm
	$f_y =$	142,85	mm
Elasticity ratio	$f_v/w =$	0	
	$f_x/(H+w) =$	0,0227	
	$f_y/(H+w) =$	0,0286	
Bending test		TEST OK	
Bending class		CLASSE 1	

3.3) Stress test

usage ratio	Check 3 =	0,8459	< 1
CC	CV =	3	
	Sezione =	1	
		TEST OK	

3.4) Cable slot test

usage ratio Upper section	Check 4 =	0,5408	< 1
usage ratio Lower section	Check 5 =	0,6822	< 1
		TEST OK	

3.5) Wind action on ground

Case 5 (2) Wind X

N =	963	N
V =	1299	N
M =	4420	Nm

Case 6 (3) Wind Y





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N = 963 N
V = 1519 N
M = 5559 Nm

3.6) Buried length

Buried length of pole

L_{inf} = 800 mm

3.6.1) Minimum buried length in a concrete basement

Rif. Quattordio - Sostegni Tubolari di acciaio - Pitagora ed. 1997 - Cap. 14.2.1

Concrete resistance class

R_{ck} = 20 N/mm²

Minimum length

e < 800 mm

TEST OK

