

CALCULATION NOTE

N.D.C. : 21337/130



Sportveldverlichting

SUPPLY OF STEEL TUBULAR MONOPOLES

Tegen uitvoering geen bezwaar

Gezien



d.d. 18/04/2017

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Behoort bij ontwerpbesluit van B&W

d.d. 28-04-2017

Behoort bij besluit van B&W

CALCULATION NOTE

STRAGO - Sportveldverlichting

N.D.C. : 21337/130 - Rev: Ø

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Ø	07/12/2012	First issue		
Rev:	Date	Modifications	Designer	Visa

1) GE NL 18m 2 floodlights

1.1) Data

Flood light : SITECO A2 MAXI Wind area with shape coefficient: $A_c = 0,19 \text{ m}^2$
 Mass: $M = 26 \text{ kg}$

Crossarm: 6880311753 length 1100 mm
 Lighting column: 7100612433 GE NL 18 m Drawing n° 60696601

Wind area (NEN-EN 1991-1-4/NB): I $v_{ref,0} = 29,5 \text{ m/s}$ terrain category II

1.2) Ultimate Limit State Mast Design note

AL-BABTAIN Software ETOXY - TECAND release V.2.20.0 : Design Engineer dmu Date : December 7, 2012

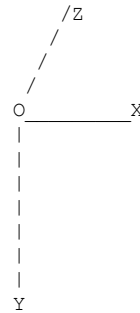
- DIMENSIONAL PROPERTIES :

SECTION	DIAMETERS (mm)		THICKNESS	LENGTH	UPPER LEVEL	OUTREACH	ANGLE/OY	YIELD POINT	CROSS SECTION
	base	top	mm		meters		degrees	daN/mm2	
1	286.4	186.6	4.00	9.100	9.100	0.000	0.000	35.50	OCTAG. ACROSS FLATS
2	194.6	101.5	3.00	8.500	17.600	0.000	0.000	35.50	OCTAG. ACROSS FLATS

WEIGHT OF POLE (kg) : 333.

- DESIGN HYPOTHESES :

STANDARDS: EN 40-3 B (classe)
 REFERENCE WIND VELOCITY (m/s): 29.50
 TERRAIN CATEGORY: II
 TOPOGRAPHY FACTOR: 1.00
 WIND MEAN RETURN PERIOD (years): 25.00
 DRAG FACTOR (STANDARD)
 WIND ACC. TO AXIS: OZ
 YOUNG'S MODULUS (daN/mm2): 21000.
 MODULUS OF TRANSV. ELASTICITY (daN/mm2): 8100.



SAFETY FACTOR, F.O.S.: 1.00

RESULTS OF NONLINEAR ANALYSIS. NATURAL PERIOD (sec) : 1.38

- LOADS APPLIED TO THE POLE :

LEVELS	Cd*AREAS	WEIGHTS	LOADS	BETA	QW*DELTA
m	m2	kg	daN		daN/m2
17.600	0.530	65.00	96.15	1.614	112.39 2 Siteco A2 maxi

WIND LOAD FACTOR $G_w : 1.20$
 DEAD LOAD FACTOR $G_p : 1.20$
 MATERIAL FACTOR $G_m : 1.05$

						Dx (m)	Dy (m)	Qte
17.600	0.530	78.00	115.38	1.614	112.39	0.000	0.000	1

OPEN SECTION			CLOSED SECTION	
$Mt_{ox1} * FOS$	$Mt_{oz1} * FOS$	$(MT_{tors} * FOS)$	$(MT_{fle} * FOS)$	$(MT_{tors} * FOS)$
CSR = -----	-----	(-----)	CSR = (-----)	(-----)
$Mt_{max.ox1}$	$Mt_{max.oz1}$	(TORmax)	(MFmax)	(TORmax)

SECTION: 1 THICKNESS (mm): 4.00 CROSS SECTION : OCTAG. ACROSS FLATS

STRAINS AT LEVEL (meters): 0.000
 X Y Z
 MOMENTS (m*daN): -7917. 0. 0.
 LOADS (daN): 0. 469. 805.

LEVELS	DIAM	Zp	Q-WIND	Mt.oX	Mt.oZ	MTfle	MTtors	MFmax	TORmax	CSR	DEFLECTIONS			ANGLES		
m	mm	cm3	daN/m2	m*daN	m*daN	m*daN	m*daN	m*daN	m*daN		X	Y	Z	X	Y	Z
0.000	286.4	344.	74.	-7917.	0.	7917.	0.	9455.	8469.	0.84	0	0	0	0.00	0.00	0.00
0.500	280.9	331.	74.	-7521.	0.	7521.	0.	9154.	8144.	0.82	0	0	1	-0.27	0.00	0.00

DOOR :1 ANGLE/AXIS X(degrees): 0.0 TWO REINFORCEMENTS : 400. mm2 IPA(cm4): 1.33 IPB(cm4): 1.33

DOOR OPENING (mm) :147.4 AT LEVEL (meters): 0.50

According to oz1:Axis PARALLEL to door plan Mt.oz1 Mtmax.oz1																
0.500	280.9	317.	74.	-7521.	0.	0.	0.	8760.	2246.	0.72	0	0	1	-0.27	0.00	0.00
According to ox1:Axis PERPEND. to door plan Mt.ox1 Mtmax.ox1																
0.500	280.9	377.	74.	-7521.	0.	-7521.	0.	10414.	2246.	0.72	0	0	1	-0.27	0.00	0.00

DOOR OPENING (mm) :143.2 AT LEVEL (meters): 1.00

According to oz1:Axis PARALLEL to door plan Mt.oz1 Mtmax.oz1																
1.000	275.4	307.	74.	-7136.	0.	0.	0.	8537.	2164.	0.71	0	0	5	-0.55	0.00	0.00
According to ox1:Axis PERPEND. to door plan Mt.ox1 Mtmax.ox1																
1.000	275.4	364.	74.	-7136.	0.	-7136.	0.	10120.	2164.	0.71	0	0	5	-0.55	0.00	0.00

DOOR OPENING (mm) :142.4 AT LEVEL (meters): 1.10

According to oz1:Axis PARALLEL to door plan Mt.oz1 Mtmax.oz1																
1.100	274.3	305.	74.	-7060.	0.	0.	0.	8493.	2148.	0.70	0	0	6	-0.61	0.00	0.00
According to ox1:Axis PERPEND. to door plan Mt.ox1 Mtmax.ox1																
1.100	274.3	361.	74.	-7060.	0.	-7060.	0.	10062.	2148.	0.70	0	0	6	-0.61	0.00	0.00
1.100	274.3	316.	74.	-7060.	0.	7060.	0.	8798.	7762.	0.80	0	0	6	-0.61	0.00	0.00
1.250	272.7	312.	74.	-6948.	0.	6948.	0.	8710.	7668.	0.80	0	0	8	-0.69	0.00	0.00

DOOR :2 ANGLE/AXIS X(degrees): 0.0 TWO REINFORCEMENTS : 400. mm2 IPA(cm4): 1.33 IPB(cm4): 1.33

DOOR OPENING (mm) :146.4 AT LEVEL (meters): 1.25

According to oz1:Axis PARALLEL to door plan Mt.oz1 Mtmax.oz1																
1.250	272.7	296.	74.	-6948.	0.	0.	0.	8276.	2057.	0.70	0	0	8	-0.69	0.00	0.00
According to ox1:Axis PERPEND. to door plan Mt.ox1 Mtmax.ox1																
1.250	272.7	357.	74.	-6948.	0.	-6948.	0.	9972.	2057.	0.70	0	0	8	-0.69	0.00	0.00

DOOR OPENING (mm) :144.3 AT LEVEL (meters): 1.50

According to oz1:Axis PARALLEL to door plan Mt.oz1 Mtmax.oz1																
1.500	269.9	291.	74.	-6763.	0.	0.	0.	8166.	2018.	0.69	0	0	11	-0.83	0.00	0.00
According to ox1:Axis PERPEND. to door plan Mt.ox1 Mtmax.ox1																
1.500	269.9	351.	74.	-6763.	0.	-6763.	0.	9828.	2018.	0.69	0	0	11	-0.83	0.00	0.00

DOOR OPENING (mm) :141.4 AT LEVEL (meters): 1.85

According to oz1:Axis PARALLEL to door plan Mt.oz1 Mtmax.oz1																
1.850	266.1	284.	74.	-6509.	0.	0.	0.	8013.	1964.	0.68	0	0	17	-1.03	0.00	0.00
According to ox1:Axis PERPEND. to door plan Mt.ox1 Mtmax.ox1																
1.850	266.1	342.	74.	-6509.	0.	-6509.	0.	9627.	1964.	0.68	0	0	17	-1.03	0.00	0.00
1.850	266.1	297.	74.	-6509.	0.	6509.	0.	8361.	7297.	0.78	0	0	17	-1.03	0.00	0.00
2.000	264.5	293.	74.	-6402.	0.	6402.	0.	8275.	7206.	0.77	0	0	19	-1.11	0.00	0.00

DOOR :3 ANGLE/AXIS X(degrees): 0.0 TWO REINFORCEMENTS : 400. mm2 IPA(cm4): 1.33 IPB(cm4): 1.33

DOOR OPENING (mm) :145.4 AT LEVEL (meters): 2.00

According to oz1:Axis PARALLEL to door plan Mt.oz1 Mtmax.oz1
 2.000 264.5 276. 74. -6402. 0. 0. 0. 7800. 1876. 0.67 0 0 19 -1.11 0.00 0.00

According to ox1:Axis PERPEND. to door plan Mt.ox1 Mtmax.ox1
 2.000 264.5 338. 74. -6402. 0. -6402. 0. 9539. 1876. 0.67 0 0 19 -1.11 0.00 0.00

DOOR OPENING (mm) :141.2 AT LEVEL (meters): 2.50

According to oz1:Axis PARALLEL to door plan Mt.oz1 Mtmax.oz1
 2.500 259.0 267. 74. -6052. 0. 0. 0. 7585. 1802. 0.65 0 0 30 -1.40 0.00 0.00

According to ox1:Axis PERPEND. to door plan Mt.ox1 Mtmax.ox1
 2.500 259.0 325. 74. -6052. 0. -6052. 0. 9258. 1802. 0.65 0 0 30 -1.40 0.00 0.00

DOOR OPENING (mm) :140.4 AT LEVEL (meters): 2.60

According to oz1:Axis PARALLEL to door plan Mt.oz1 Mtmax.oz1
 2.600 257.9 265. 74. -5982. 0. 0. 0. 7542. 1788. 0.65 0 0 33 -1.45 0.00 0.00

According to ox1:Axis PERPEND. to door plan Mt.ox1 Mtmax.ox1
 2.600 257.9 323. 74. -5982. 0. -5982. 0. 9202. 1788. 0.65 0 0 33 -1.45 0.00 0.00

2.600	257.9	278.	74.	-5982.	0.	5982.	0.	7933.	6846.	0.75	0	0	33	-1.45	0.00	0.00
3.000	253.5	269.	74.	-5710.	0.	5710.	0.	7708.	6612.	0.74	0	0	44	-1.68	0.00	0.00
3.500	248.0	257.	74.	-5378.	0.	5378.	0.	7431.	6325.	0.72	0	0	60	-1.97	0.00	0.00
4.000	242.5	246.	74.	-5056.	0.	5056.	0.	7157.	6044.	0.71	0	0	78	-2.26	0.00	0.00
4.500	237.1	235.	77.	-4743.	0.	4743.	0.	6888.	5769.	0.69	0	0	99	-2.55	0.00	0.00
5.000	231.6	224.	80.	-4439.	0.	4439.	0.	6623.	5501.	0.67	0	0	123	-2.84	0.00	0.00
5.500	226.1	213.	82.	-4145.	0.	4145.	0.	6362.	5239.	0.65	0	0	149	-3.13	0.00	0.00
6.000	220.6	203.	84.	-3861.	0.	3861.	0.	6105.	4984.	0.63	0	0	177	-3.43	0.00	0.00
6.500	215.1	193.	86.	-3587.	0.	3587.	0.	5852.	4735.	0.61	0	0	208	-3.73	0.00	0.00
7.000	209.7	183.	88.	-3323.	0.	3323.	0.	5604.	4493.	0.59	0	0	242	-4.02	0.00	0.00
7.500	204.2	173.	90.	-3068.	0.	3068.	0.	5360.	4256.	0.57	0	0	279	-4.32	0.00	0.00
8.000	198.7	164.	91.	-2824.	0.	2824.	0.	5120.	4026.	0.55	0	0	318	-4.62	0.00	0.00
8.500	193.2	155.	93.	-2589.	0.	2589.	0.	4884.	3803.	0.53	0	0	359	-4.92	0.00	0.00
8.650	191.6	152.	93.	-2521.	0.	2521.	0.	4814.	3737.	0.52	0	0	372	-5.01	0.00	0.00

