Peter Sterken — **Wind load analysis in trees** — www.sterken.be

in accordance with Eurocode 1, part 2-4

V model — **and critical wind speeds**

Species= *Ulmus minor* "El Olmo de Somontes" El Pardo. Madrid, España.

Data input=

Height tree=	24,00	m
Circumference=	547,89	cm
Bark thickness=	5,85	cm
Residual wall, t=	3,44	cm
Cw-value=	0,25	

Material properties

Compression strength=	2,00	kN/cm*cm

Environment=

Altitude=	664,00	m
Minimum temperature=	0,00	°C

Expected wind speed for the area=

	125,63	km/h
	34,90	m/s

Results=

Wind load analysis for trees

Crown area=	382,2 m*m
Wind load=	76,3 kN
Wind speed=	**36,6 m/s**
at height=	13,5 m
Wind induced bending moment=	1028,5 kNm

Torsion safety of the closed and concentric residual wall*

Vcr_torsion=	**43,6 m/s**
Safety=	141,8 %

Bending fracture of the sound stem=

Vcr_bending=	**105,0 m/s**
Safety=	822,2 %
Required t=	3,44 cm

Bending fracture of the residual wall=

Vcr_residual wall:	**41,8 m/s**
Safety=	130,5 %
	100,0 %
	36,6 m/s

Dynamics=

Natural frequency=	13,4 Hz
Vcrit_resonance=	**108,9 m/s**
Equivalent wind load=	674,9 kN