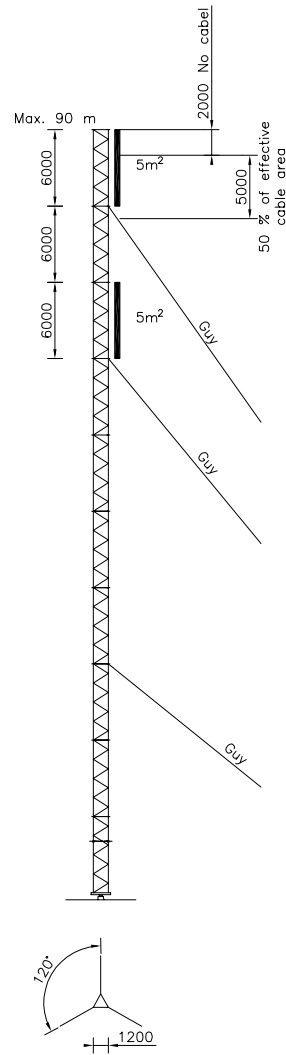
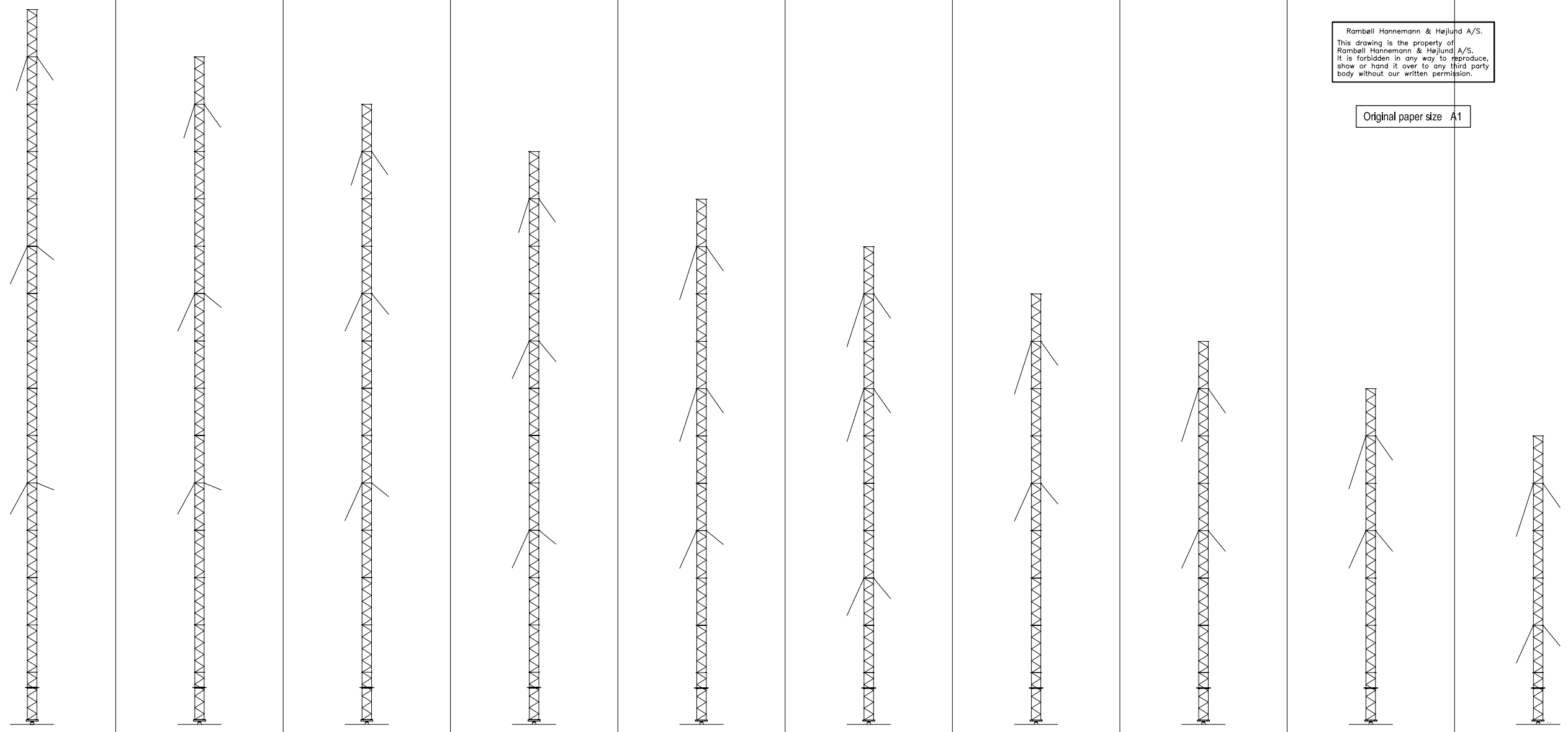


Load conditions



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Original paper size A1



Mast type. (Rambøll drawing)	90 m Light	84 m Light	78 m Light	72 m Light	66 m Light	60 m Light	54 m Light	48 m Light	42 m Light	36 m Light
Drawing: (Rambøll drawing)	M149	M148	M147	M146	M145	M144	M143	M142	M141	M140
Foundation, Soil: (Rambøll drawing)	FM1008	FM1008	FM1008	FM1008	FM1008	FM1008	FM1008	FM1008	FM1008	FM1008
Foundation, Rock: (Rambøll drawing)	FM1007	FM1007	FM1007	FM1007	FM1007	FM1007	FM1007	FM1007	FM1007	FM1007
Guy Foundation, Soil: (Rambøll drawing)	FM1014	FM1014	FM1014	FM1014	FM1014	FM1014	FM1013	FM1013	FM1013	FM1013
Guy Foundation, Rock: (Rambøll drawing)	FM1018	FM1018	FM1018	FM1018	FM1018	FM1018	FM1018	FM1018	FM1018	FM1018
Erection weight (kg)	5260	4930	4600	4270	3940	3610	3230	2900	2570	2240

Distribution of mast types on heights, wind categories and wind speed for 5m² + 5m² antenna area

Height	Reference wind speed 26 m/s				Reference wind speed 25 m/s				Reference wind speed 24 m/s				Reference wind speed 23 m/s				Reference wind speed 22 m/s			
	TC 1	TC 2	TC 3	TC 4	TC 1	TC 2	TC 3	TC 4	TC 1	TC 2	TC 3	TC 4	TC 1	TC 2	TC 3	TC 4	TC 1	TC 2	TC 3	TC 4
36 m	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light
42 m	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light
48 m	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light
54 m	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light
60 m	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light
66 m	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light
72 m	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light	Light
78 m	Normal	Normal	Light	Light	Normal	Normal	Light	Light	Normal	Normal	Light	Light	Normal	Normal	Light	Light	Normal	Normal	Light	Light
84 m	Normal	Normal	Light	Light	Normal	Normal	Light	Light	Normal	Normal	Light	Light	Normal	Normal	Light	Light	Normal	Normal	Light	Light
90 m	Normal	Normal	Light	Light	Normal	Normal	Light	Light	Normal	Normal	Light	Light	Normal	Normal	Light	Light	Normal	Normal	Light	Light

Erection weights

Guy ropes and guy tensioners are not included

Section	Section weight (kg)
S3	300
Guy Frame	50
Mast Base	160
Safety rail	5 kg/m

NOTE:

Codes
The masts are designed according to the Swedish codes BKR 99, BSK 99 and BSV 97 (Snö och vindlast, 2. ed). The structures are designed according to safety class 1 with partial coefficient $g_n = 1,0$. For the tensile strength of guys an extra partial coefficient for $g_n = 1,25$ is used.

Wind climate
The masts are designed for all combinations of wind speeds ranging from 22 m/s to 26 m/s and terrain categories I to IV. The mast type to be used for each particular combination is stated in table 1.

The masts are designed for a maximum allowable rotation of +/- 0,7 degrees for the characteristic wind velocity of 25 m/s constant over height.

Load
All masts are designed for a uniformly distributed wind area of 5 m² over the top 6 m and a uniformly distributed wind area of 5 m² from 12 m to 18 m below the mast top. In addition to this a uniformly distributed wind area from cables and feeders of 0,50 m²/m is applied to the mast up to 7 m below the top and 0,25 m²/m is applied from 2 m to 7 m below the top. A torsional contribution of 1,5 m² * m is added to the mast loading, distributed over the entire height of the mast.

Steel material
Leg member tubes and diagonal tubes are of steel quality S355JRH. Tubes for legs and diagonals are according to EN10210-1. Flange plates and gusset plates welded on legs are of steel quality S355J2G3, while ladder and cable ladder are of steel quality S235JR/S235JR2 all according to EN10025.

Bolts in flanges between sections are of quality 8.8 with corresponding nuts in class 8 in accordance with EN 20898/1 and EN 20898/2. Structural washers are in accordance with ISO 7089/ISO 7090/DIN 125 - 200HV. Dimensions of bolts in flange plates are M20. All U-clamps shall be in stainless steel in quality as SS2333, annealed condition.

Welds
Welds between leg tubes and flange plates shall be of quality level C. (according to EN 25817 and 26520). All other welds shall be quality level D.

Guys
Guy ropes are of the spiral strand type. The rope dimension is $\phi 13$ mm with an area of 107 mm² and the construction 1x19. Wires are hot dip galvanized. Minimum breaking load of guys is 155 kN and modulus of elasticity is 160.000 MPa. Guy tensioners are of the type "stagtinge med doble kiler".

Guy ropes are attached to the mast sections by means of a short guy tensioner. The same system is used at the foundation yet by means of a longer guy tensioner which serves as rope tensioner. The force is transferred to the guy tensioner by a wedge and a tensioned bolt secures the protruding rope end. The wedge is secured to the guy tensioner by double nuts on the threads. The lengths of the guys are cut at site by the contractor responsible for the erection of the masts.

Ladder and cable ladder
Climbing ladder and cable ladder is an integrated unit, cable steps per 600 mm and ladder steps per 300 mm. The width of the ladder steps is 400 mm and the width of the cable steps is 2 * 230 mm. The ladder is placed inside the cross section on one of the mast faces and welded to the diagonals before hot dip galvanizing.

Surface treatment
All structural steel members are hot dip galvanized according to EN/ISO 1461 with a minimum thickness of 115 μ m. Structural bolts, nuts and washers are hot dip galvanized according to EN/ISO 1461. Stainless steel U-bolts shall be pickled on completion.

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RAMBOLL 36 m - 90 m Light Masts						File: TKS-M008 Drawing no.
General note						M008