

MEMO

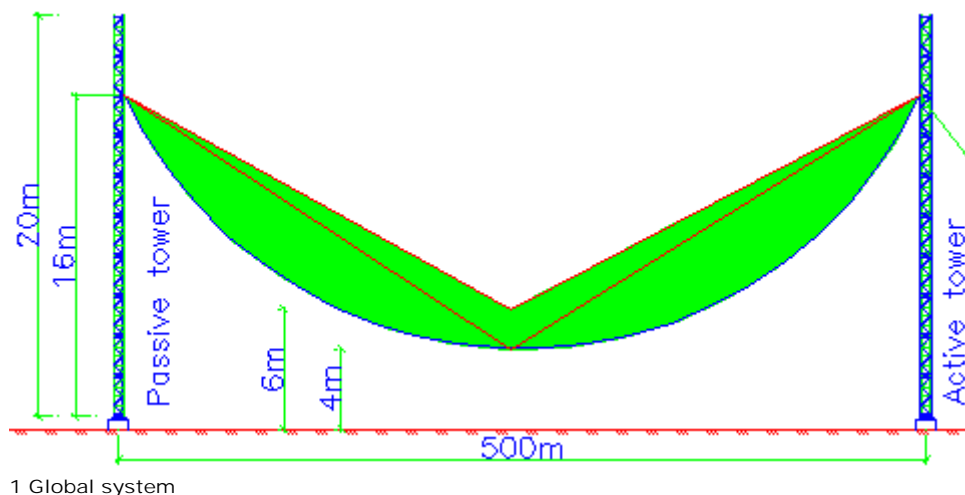
Date 2013/02/13

Job 1110050Y
 Client NRK
 Memo no 001
 Date 2013/02/13
 To Jan Benkholt
 From Andreas Røed and Øyvind Sætre
 Copy to

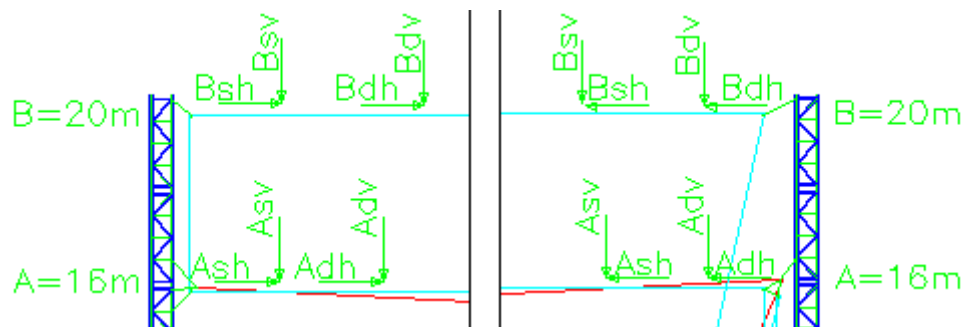
1. Wirecam cabled system

With reference to e-mail dated 2013/01/14 from John Pearce with questions regarding the wire cam system NRK intend using filming the biathlon in the Sochi Olympics, we will here try to answer the questions on basis of information given from Jan Benkholt, NRK.

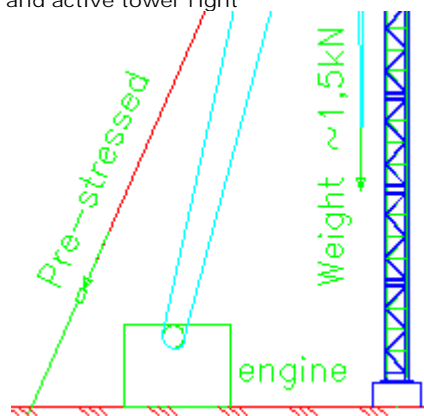
NRK usually rigs the system so that the camera on the lowest point is 4m above ground. For the low point of the camera, on centre of the rope, to be 4m off the ground we have calculated that the bearing rope needs to be pre-stressed to 10,78 kN. We also have added a load case where this low-point is at 6m above ground. For the low point 6 m case the pre-stressing is calculated to be 12,94 kN, this gives an utilization of the rope of 16%. On the sketch below we have shown the estimated working area for the camera along the rope.



The loads on the towers are calculated based on mounting points of the bearing rope 16m off the ground and 16m and 20 meters for the pulling rope. The loads are assumed to be working along the towers central axis, as the eccentricities of the hoists have little/no effect on the global system. We have multiplied all loads with a factor of $\gamma=2,0$



2 Load components passive tower left, and active tower right



3 Ground level of active system

Design loads (kN, $\gamma=2,0$)			Low point 4m	Low point 6m
Active tower	Static load	Ash	23,1	27,4
		Asv	28,16	32,5
	Dynamic load	Adh	1,32	1,32
		Adv	4,0	4,0
	Static load	Bsh	1,5	1,5
		Bsv	1,5	1,5
Dynamic load	Bdh	1,32	1,32	
	Bdv	1,32	1,32	
Passive tower	Static load	Ash	23,1	27,4
		Asv	0	0
	Dynamic load	Adh	1,32	1,32
		Adv	-1,32	-1,32
	Static load	Bsh	1,5	1,5
		Bsv	0	0
Dynamic load	Bdh	1,32	1,32	
	Bdv	1,32	1,32	

Loads from wind and ice are not included.