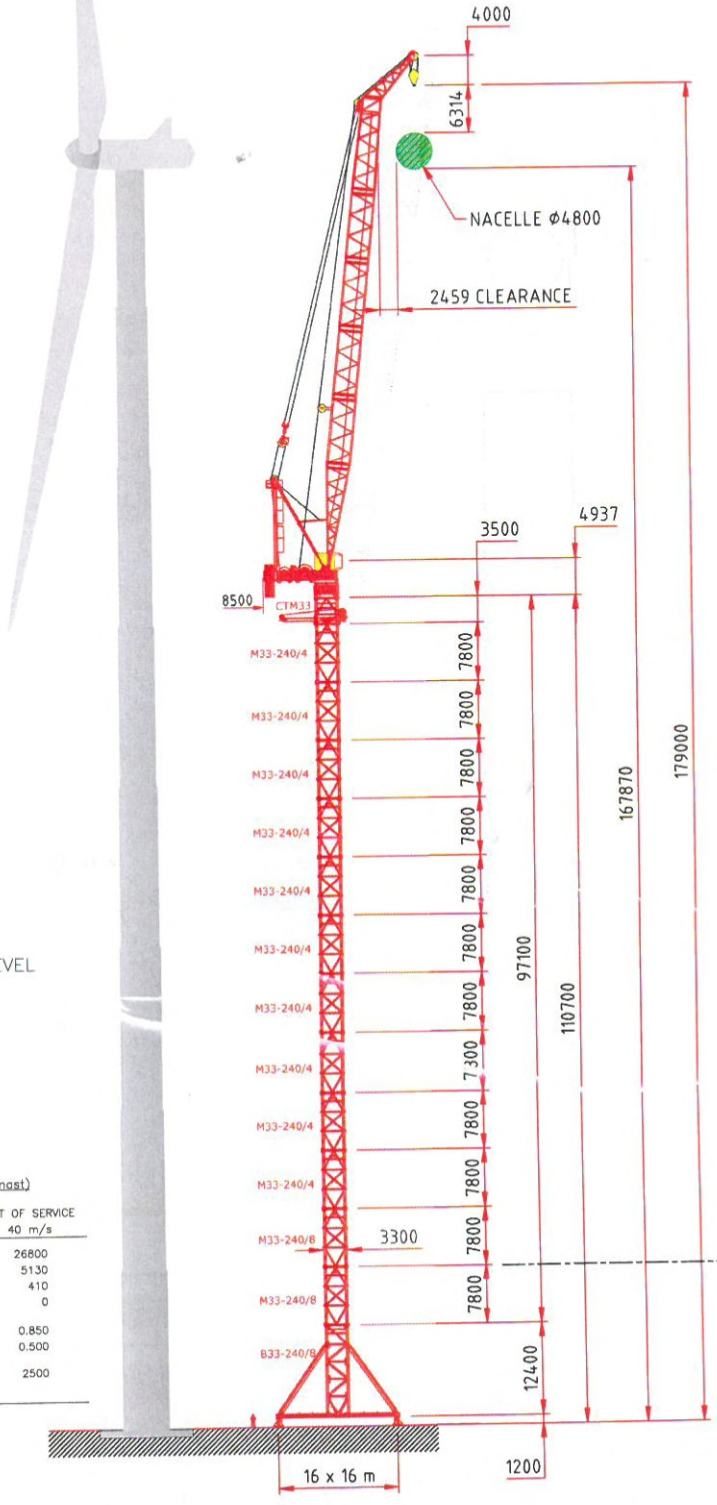
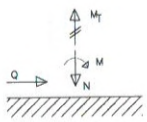
KRØLL CRANES

ERECTED DIMENSIONS

Lifts above 60 tonnes are limited to 15 m/s wind speed



FORCES AT GROUND LEVEL



BASE FORCES, 167.0 m (109.8 m mast)

Wind speed	IN SERVICE 15 m/s	OUT OF SERVICE 40 m/s
M (kNm)	27850	26800
N (kN)	6580	5130
Q (kN)	120	410
M_T (kNm)	800	0
Deflection, masth. (m)	1.500	0.850
Tilt, masth. (degrees)	1.100	0.500
Corner load (kN) 16x16m BX	3000	2500

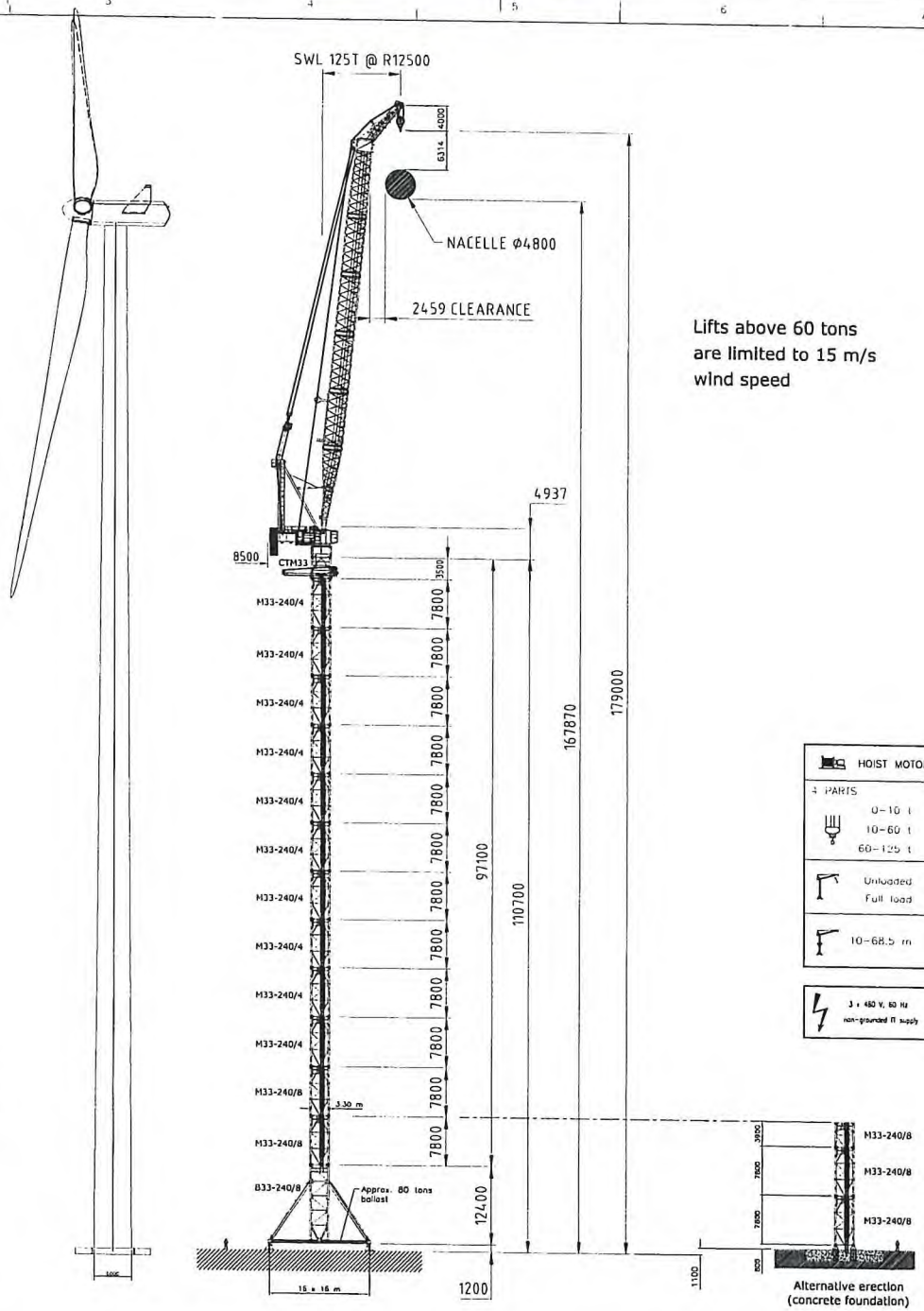
INHALTSVERZEICHNIS

1. BLATT: AUFSTELLPLAN ,,MAßE“ MIT LASTFÄLLEN
2. BLATT: MONTAGESCHRITTE
3. BLATT: GRUNDGESTELL MIT BRITTPLATTE, 2 X VORHANDEN
4. BLATT: GRUNDGESTELL
5. BLATT: KLETTERKÄFIG (2 X VORHANDEN)
6. BLATT: LASTENDIAGRAMM
7. BLATT: GEWICHTE
8. BLATT: FOTO MIT ZUSÄTZLICHEN WINDEN
9. BLATT: FOTO STROMAGGREGAT
10. BLATT: FOTO DER BRITTPLATTEN
11. BLATT: FOTO TURMENDE MIT KLETTERKÄFIG

ERECTION MANUEL - AUFBAUHINWEISE

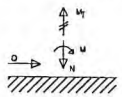
1 Blad

K1500L



Lifts above 60 tons are limited to 15 m/s wind speed

FORCES AT GROUND LEVEL



BASE FORCES, 167.0 m (109 m mast)

Wind speed	IN SERVICE 15 m/s	OUT OF SERVICE 40 m/s
M (kNm)	27800	26800
N (kN)	6560	5150
Q (kN)	130	410
M_T (kNm)	800	0
Deflection, masth. (m)	1.500	0.850
Tilt, masth. (degrees)	1.100	0.500
Corner load (kN) 16x16m BX	3000	2500

PERFORMANCE

HOIST MOTOR : 160 kW	
4 PARTS	
0-10 t	0-22 m/min
10-60 t	0-13 m/min
60-125 t	0-8 m/min
Unloaded	3:00 min:sec
Full load	4:00 min:sec
10-68.5 m	0-0.5 rpm

3 x 480 V, 60 Hz non-grounded IT supply	CONTROL VOLTAGE 24 VDC - 230 VAC

K1500L LOAD CHART
MAIN HOIST 4-FALL
69 m BOOM

RADIUS (METRES)	BOOM ANGLE (DEGREES)	S.W.L. (TONNES)
10.1	86.0	125.0
12.5	84.0	125.0
15.0	81.9	100.4
17.5	79.8	82.1
20.0	77.6	68.5
22.5	75.5	57.8
25.0	73.3	49.3
27.5	71.0	42.4
30.0	68.8	36.6
32.5	66.5	31.7
35.0	64.1	27.5
37.5	61.7	23.9
40.0	59.2	20.8
42.5	56.6	18.1
45.0	54.0	15.7
47.5	51.2	13.5
50.0	48.3	11.6
52.5	45.3	9.8
55.0	42.0	8.2
57.5	38.5	6.7
60.0	34.7	5.4
62.5	30.5	4.2
65.0	25.4	3.1
67.5	18.6	2.2
68.5	15.0	1.8

KONST.: 150313 JL	PROJ	KRANTYPE	STK	SAML. TEGN.	
TEGN.: 150313 JL					
GODK.: 150313 JL					
ERSTATTER:	SKALA: 1:300	OVERF. AREAL m²	OVERFLADE-BEHANDLING	MATR.	
ERSTATTET AF:	TOTALVÆGT: kg		ANT. TEGNING.:	DIM.: ANT. STYKL.:	
OPRINDELSE:	TRANSPORTMÅL: m³		TITEL: K1500L M33 tower sections		

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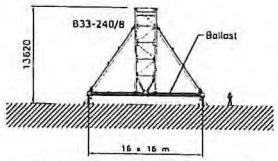
PHONE: +45 48 187400 FAX: +45 48 186807

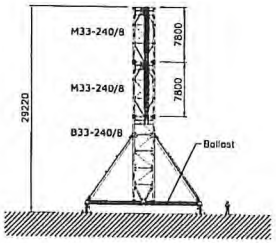
TEGN. NR. C1-00.00091001-08

2 Blatt

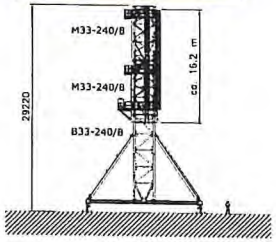
Blatt 2 3



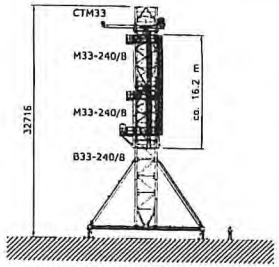
Erection of bottom mast, cross and supporting legs



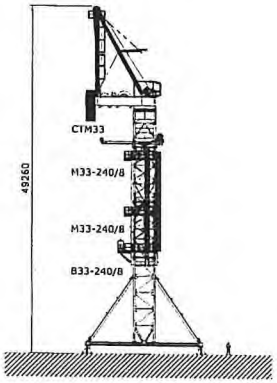
Fitting of two mast sections



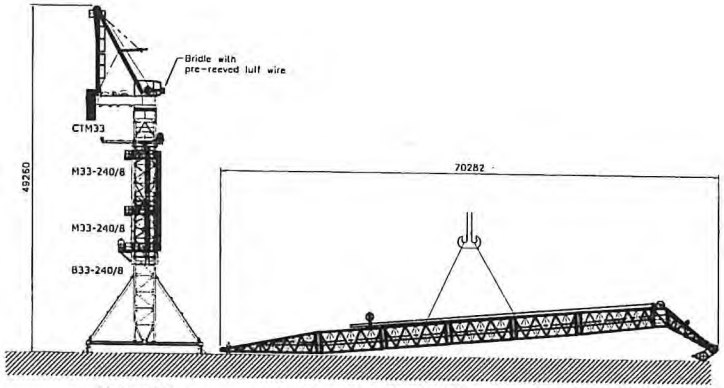
Fitting of CT33 climbing cage



Fitting of CTM33 climbing frame and masthead (slew-mount)

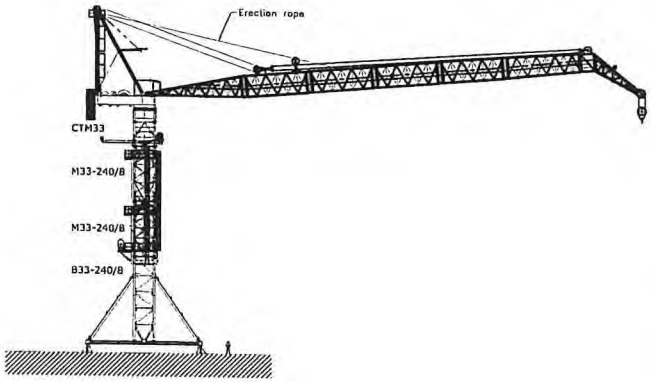


Fitting of masthead, deck, toptower and counterweight

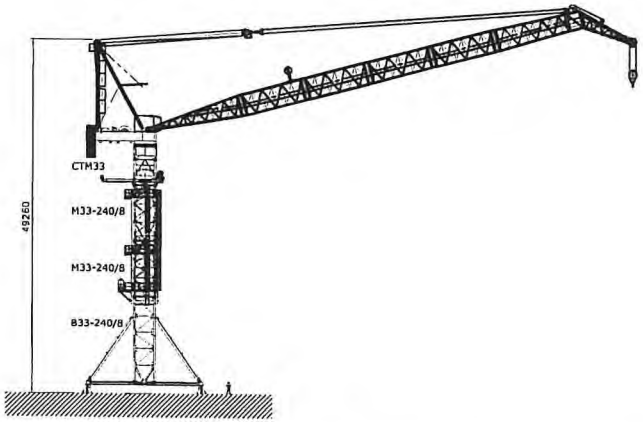


Fitting of boom

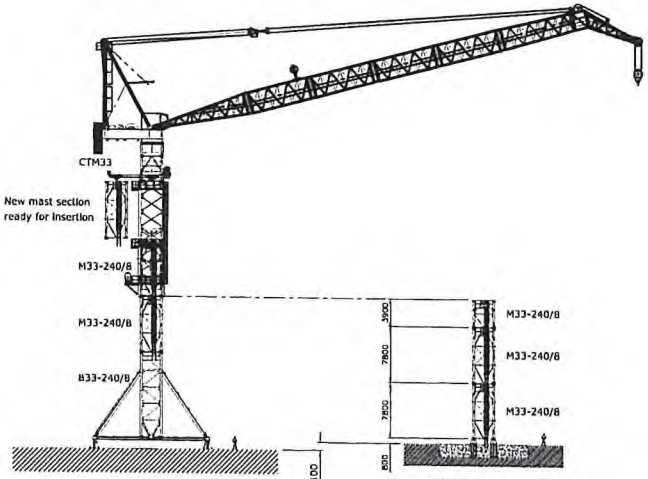
Assemble boom on the ground and reeve the hoist wire



Reeving of hoist and luff wire



Ready for operation



Climbing to required height

Alternative erection (concrete foundation)

KONST.: 150313 JL	PROJ.	KRANTYPE	STK	SAML. TEGN.	
TEGN.: 150313 JL					
GODK.: 150313 JL					
ERSTATTER:	SKALA: 1:250	OVERF. AREAL: m²	OVERFLADE-BEHANDLING:	MATR.:	
ERSTATTET AF:	TOTALVÆGT: kg			DIM.:	
OPRINDELSE:	TRANSPORTMÅL: m³		ANT. TEGNING.: 2 / 2	ANT. STYKL.:	

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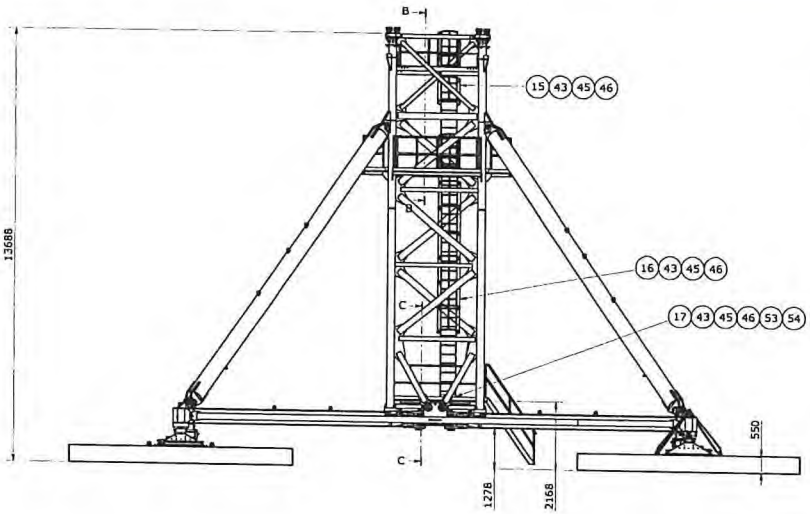
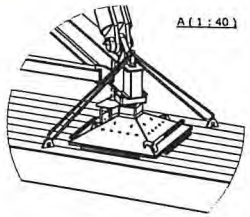
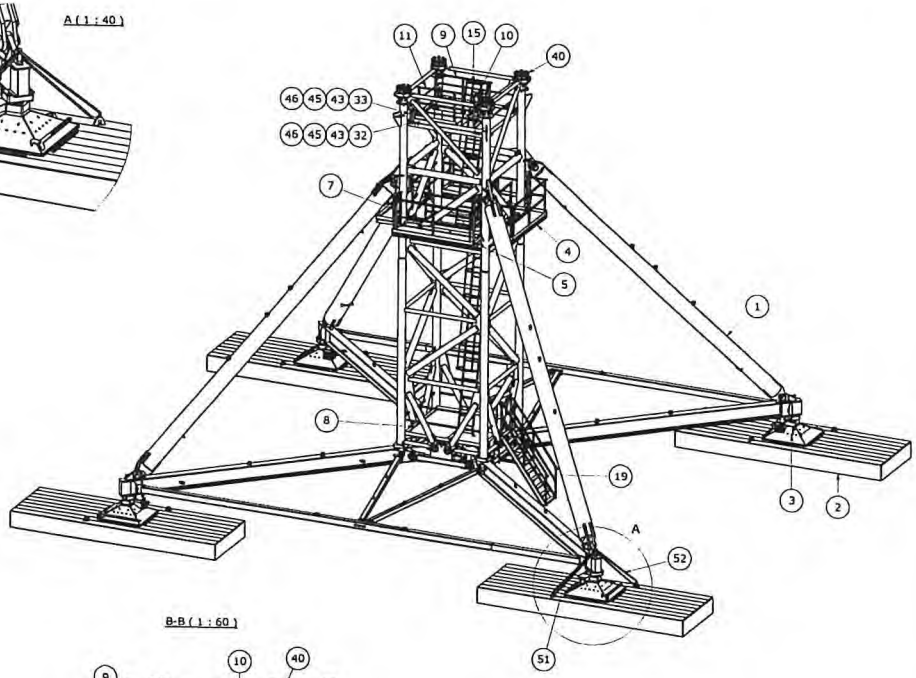
TITEL: K1500L M33 tower sections

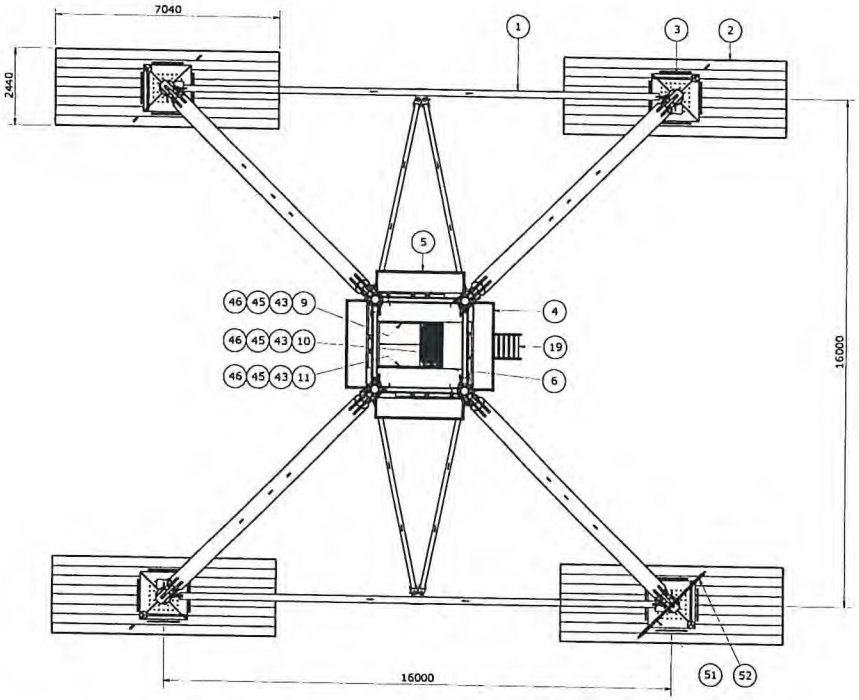
TEGN. NR.: C1-00.00091001-08

3 Blatt

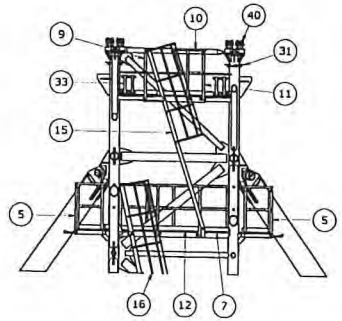




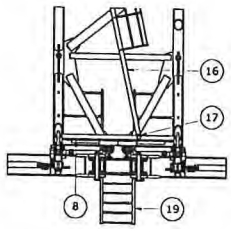




B-B (1 : 60)



C-C (1 : 60)



Rev.01 (150602 HK): BOM is updated. "DRAFT" text added.
Rev.02 (150617 HK): Item 7+8+12+15+16+17 released for production.
61676 (item 10) replaced by 63532. Item 13 deleted. Item 53+54 added.

Item	Drawing/part no.	Title	Length	Type/quality	Pcs	Weight	Total weight
54	xxx42.83100012	Washer M12 40x40x4		DIN 436	3	0	0
53	xxx42.11112060	Bolt M12 x 60		8.8 DIN931 FZB	3	0	0
52	xxx32.00080084	Rounding BMP 4m	DRAFT	Polyester	1	3	3
51	xxx33.00080085	Rounding BMP 4m	DRAFT	Polyester	1	3	3
50	C3-38.00017977	Safety pin		Fjedersål	8	0	0
46	xxx42.11500012	Nut M12		8.DIN934 FZB	43	0	1
45	xxx42.81900012	Washer M12		DIN125A FZB	43	0	0
43	xxx42.11112035	Bolt M12 x 35		8.8 DIN931 FZB	32	0	1
42	xxx42.11112130	Bolt M12 x 130		8.8 DIN931 FZB	4	0	1
41	xxx42.11212240	Bolt M12 x 240		8.8 DIN931 FZV	4	0	1
40	xxx42.00080002	Mast bolt/m4 2.25"			32	10	311
33	C3-58.00061679	Nut storage			8	3	23
32	C3-58.00063515	Mast bolt storage			4	1	5
31	C3-01.00061658	Mast bolt storage, left			4	6	23
30	C3-58.00061658	Mast bolt storage, right			4	6	23
19	C1-64.00063520	Stairway	DRAFT		1	160	160
17	C3-01.00063536	Ladder bracket			2	1	2
16	C1-64.00061926	Ladder, lower part			1	200	200
15	C1-64.00061692	Ladder, upper part			1	90	90
12	C3-64.00063531	Railing panel 1390 mm			1	24	24
11	C3-64.00061674	Railing panel 1410 mm			1	24	24
10	C3-64.00063532	Railing panel 760 mm			1	18	18
9	C3-64.00061675	Railing panel 2015 mm			1	36	36
8	C3-64.00061895	Gratings for B33		30/3	1	149	149
7	C3-64.00061937	Gratings, support leg platform		30/2	1	56	56
6	C3-64.00061677	Gratings N33/B33		25/2	1	81	81
5	C2-64.00061930	Platform assembly, left			2	228	456
4	C2-64.00061920	Platform assembly, right			2	213	426
3	C1-07.00061653	Pyramid assembly			4	1523	6093
2	C3-01.00063505	Foundation plate		CUSTOMER SUPPLY	4	13272	53088
1	C1-01.00061661	B33 16x16m assembly			1	49224	49224

DESIGN : 150519 HK	PROJ.	CRANE TYPE	QTY	ASSEMBLY DRAWING	
DRAWN : 150519 HK		K1500L			
CHECK : 150519 JL					
REPLACES	SCALE 1 : 80	SURFACE AREA m²	SURFACE TREATMENT	MATR	
REPLACED BY	TOTAL WEIGHT 110530 kg			DIM	
ORIGINATES FROM	VOLUME m³			SHEET NUMBER 1 / 1	PARTS LIST

TITLE: B33 16x16m main assembly

KRØLL CRANES A/S
NORDKRANVEJ 2 · 3540 LYNGE · DENMARK

DRAWING NO.: C1-01.00061660-02

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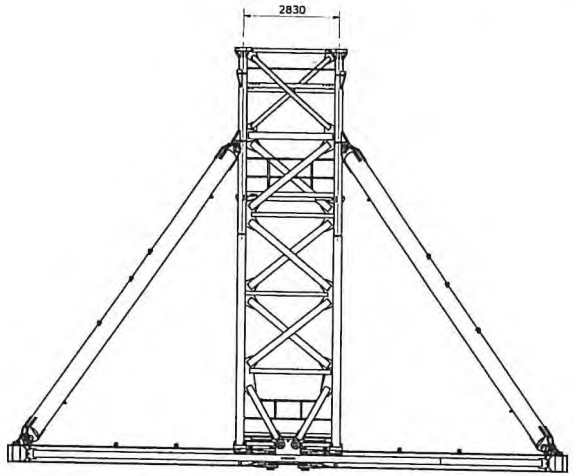
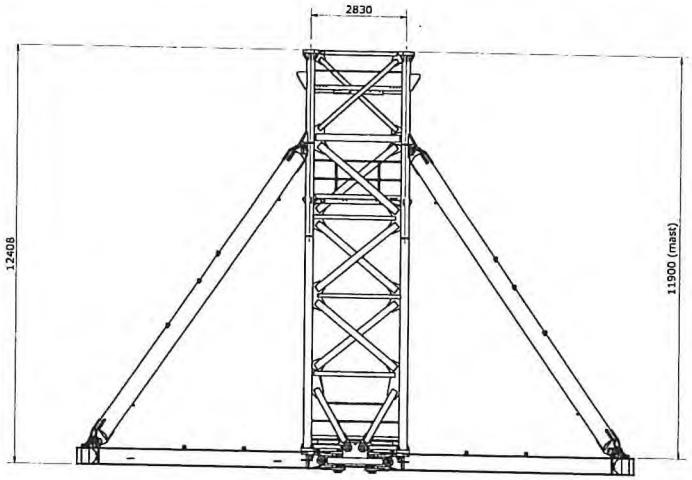
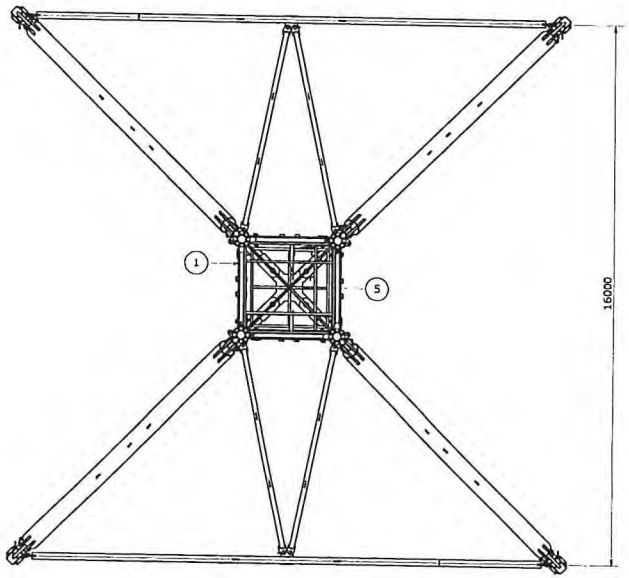
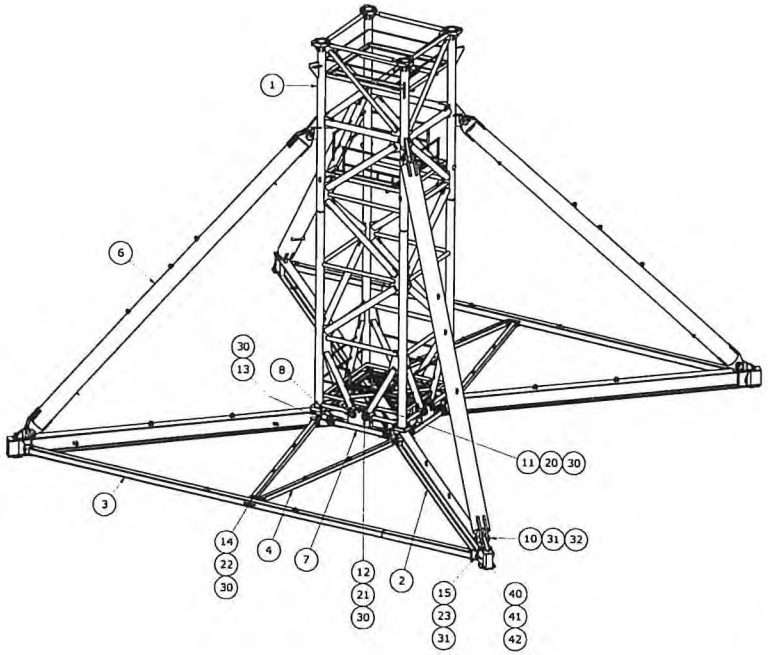
4 Blatt









Item	Drawing/part no.	Title	Length	Type/quality	Pcs	Weight	Total weight
81		PL80 x 350		S355 J2+N	1	86	86
42	xxx42.24600024	Nut M24		10. DIN6913 FZV	8	0	1
41	xxx42.84600024	Washer M24		10 DIN6916 FZV	16	0	1
40	xxx42.24724085	Bolt M24 x 85		10.9 DIN6914 FZB	8	0	4
32	C4-44.00061934	Safety pin		S235 JR	8	0	3
31	C3-38.00017977	Safety pin Ø4		Spring steel	13	0	0
30	C3-38.00017978	Safety pin Ø6.3		Fjederstål	36	0	0
23	C4-47.00026632	Washer D51/Ø80x3		S235 JR	4	0	6
22	C4-47.00017810	Washer D72/Ø120 x 4		S452-3	8	0	2
21	C4-47.00046384	Washer D133/Ø170 x 4		S235 JR	8	0	3
20	C4-47.00046185	Washer D133/Ø180 x 4		S437	4	0	1
15	C4-45.00061939	Catterbelt D50 x 65/90		E335	4	1	8
14	C4-45.00061938	Catterbelt D70 x 68/100		E335	8	3	26
13	C4-45.00061936	Catterbelt D120 x 225/265		E335	8	23	184
12	C4-45.00061937	Catterbelt D120 x 273/305		C55E	8	27	220
11	C2-45.00061940	Catterbelt D130 x 300/390			4	62	247
10	C4-45.00061935	Catterbelt D160 x 345/390			8	63	561
9	C3-43.00023862	Pinbolt/nuts 2.25" x 6 UN			8	11	85
7	C2-01.00061669	Horizontal member			4	344	1377
6	C1-01.00061668	Supporting leg			4	2908	11630
5	C1-01.00061667	Center cross			1	1051	1051
4	C2-01.00061666	Torsion member			4	211	843
3	C2-01.00061665	Side beam			4	935	1871
2	C1-01.00061664	Bottom cross			4	2720	10881
1	C1-01.00061663	Bottom mast B33-240			1	20279	20279

DESIGN : 150205 HK	PROJ	CRANE TYPE	QTY	ASSEMBLY DRAWING
DRAWN : 150205 HK		K1500L		
CHECK : 150205 JL				
REPLACES	SCALE 1 : 75	SURFACE AREA m²	SURFACE TREATMENT	MATR
REPLACED BY	TOTAL WEIGHT 49308 kg			DIM
ORIGINATES FROM	VOLUME m³		SHEET NUMBER 1 / 1	PARTS LIST

TITLE
B33 16x16m assembly

KRØLL CRANES A/S
NORDKRANVEJ 2 · 2640 HEDEHUSENE · DENMARK

DRAWING NO
C1-01.00061661-00

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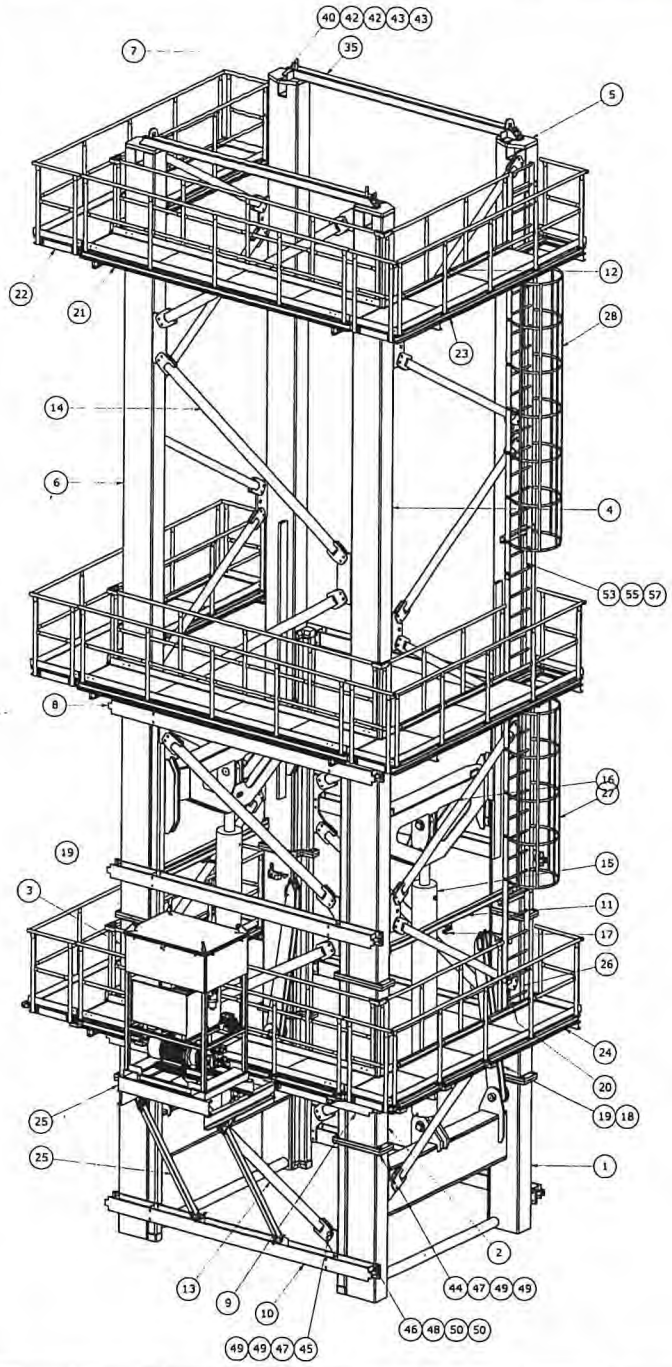
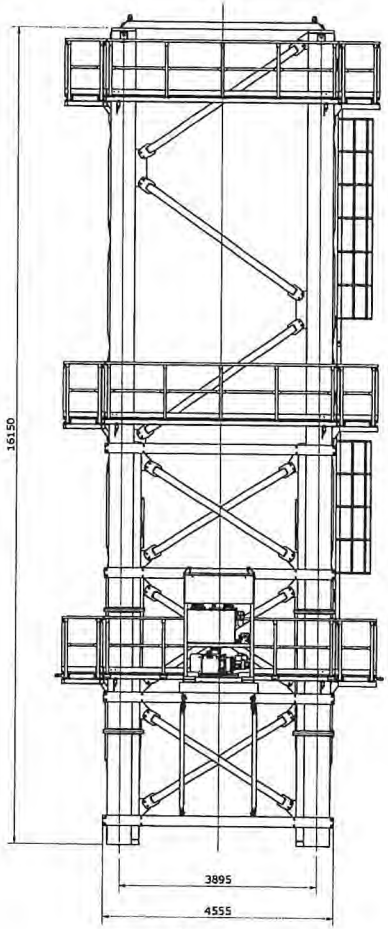
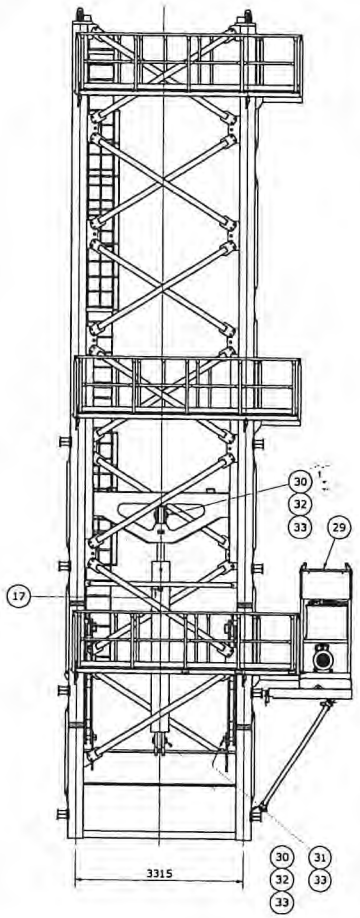
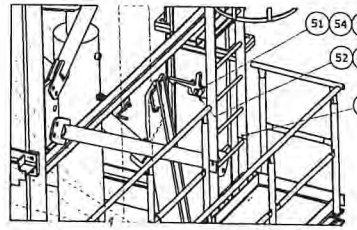
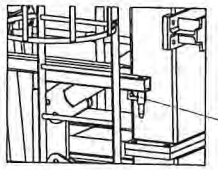
5 Blatt

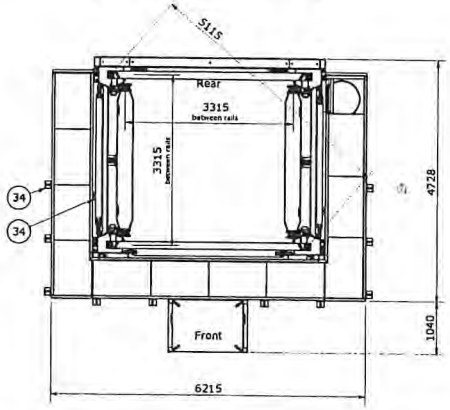


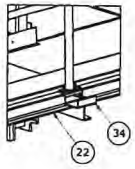












Rev.02: Pos 35 added
Rev.01: Pos 34 added

57	xxx42.81900013	Washer M12		DIN125A FZB	8	0	0
56	xxx42.81900020	Washer M20		DIN125A FZB	4	0	0
55	xxx42.11500012	Nut M12		8 DIN934 FZB	8	0	0
54	xxx42.11500030	Nut M30		8 DIN934 FZB	4	0	0
53	xxx42.11112035	Bolt M12 x 35		8.8 DIN931 FZB	8	0	0
52	xxx42.11112055	Bolt M12 x 55		8.8 DIN931 FZB	4	0	0
51	xxx42.11120080	Bolt M20 x 80		8.8 DIN931 FZB	4	0	1
50	xxx42.84600024	Washer M24		10 DIN6916 FZV	128	0	4
49	xxx42.84600030	Washer M30		10 DIN6916 FZV	248	0	18
48	xxx42.24600024	Nut M24		10. DIN6915 FZV	64	0	11
47	xxx42.24600030	Nut M30		10. DIN6915 FZV	124	0	30
46	xxx42.24724080	Bolt M24 x 80		10.9 DIN6914 FZV	64	0	25
45	xxx42.24730105	Bolt M30 x 105		10.9 DIN6914 FZV	92	1	83
44	xxx42.24730120	Bolt M30 x 120		10.9 DIN6914 FZB	32	1	32
43	xxx42.81900048	Washer M48		DIN125A FZB	8	0	2
42	xxx42.11500048	Nut M48		8 DIN934 FZB	8	1	8
40	xxx42.14148360	Threaded pin M48 x 360		8.8 DIN931 FZB	4	4	15
36							
35	C3-50.00063563	Top Beam for CT33			2	170	340
34	C3-38.00061795	Bracket for hydraulic hose			13	2	30
33	xxx38.89408130	Cotter D8 x 130			8	0	0
32	C4-47.00043359	Washer D101/D150 x 4			4	0	1
31	C4-45.00061784	Cotterbolt D80 x 260		CK60	4	11	43
30	C4-45.00061783	Cotterbolt D100 x 310/145		34CrNiMo6	4	15	62
29	xx410.00059368	Hydraulic pump station, CT33			1	1500	1500
28	C3-64.00061891	Upper ladder assembly			1	159	159
27	C3-64.00061890	Lower ladder assembly			1	139	139
26	C3-64.00061873	Bottom ladder			1	10	10
25	C3-64.00061866	Platform, pump station			1	226	226
24	C3-64.00061881	Left platform assembly, lower level			1	359	359
23	C2-64.00061875	Left platform assembly, upper levels			1	350	700
22	C2-64.00061877	Right platform assembly, 3 levels			3	366	1098
21	C2-64.00061879	Center platform assembly, 2 levels			3	353	1058
20	C3-64.00061846	Pawl for claw			4	4	16
19	C2-08.00061790	Fixed claw, right			2	217	434
18	C2-08.00061790	Fixed claw, left			2	217	434
17	C3-08.00061845	Cylinder handle			2	2	4
16	C1-08.00061787	Cylinder yoke (retractable claws)			2	892	1785
15	C3-10.00061791	Cylinder, 165 tons			2	1491	2983
14	C3-08.00061782	Diagonal, rear side (top half)			2	97	290
13	C3-08.00061781	Diagonal, front and rear (bottom)			6	86	517
12	C3-08.00061780	Diagonal, cylinder sides			4	71	996
11	C3-08.00061786	Horizontal, cylinder support			2	58	117
10	C2-08.00061792	Horizontal, pump station supp.			1	295	295
9	C2-08.00061793	Horizontal, pump station			1	287	287
8	C2-08.00061785	Horizontal, front and rear			6	284	1703
7	C1-08.00061777	Top corner member 4			1	2475	2475
6	C1-08.00061776	Top corner member 3			1	2498	3499
5	C1-08.00061775	Top corner member 2			1	2436	2436
4	C1-08.00061774	Top corner member 1			1	2534	2534
3	C1-08.00061773	Bottom corner member 2+4			2	755	1511
2	C1-08.00061772	Bottom corner member 1+3			2	706	1412
1	C1-08.00061771	Bottom legs w. cylinder frame			1	3713	5424
Item	Drawing/part no.	Title		Length	Type/quality	Pcs	Weight	Total weight

DESIGN : 161223 KK	PROJ.	CRANE TYPE	QTY	ASSEMBLY DRAWING
DRAWN : 161223 KK		CT33		
CHECK : 150330 JL				
REPLACES	SCALE: 1:50	SURFACE AREA: m²	SURFACE TREATMENT:	MATR:
REPLACED BY	TOTAL WEIGHT: 34114 kg			DIM:
ORIGINATES FROM	VOLUME: m³		SHEET NUMBER: 1 / 1	PARTS LIST

TITLE: CT33 main assembly

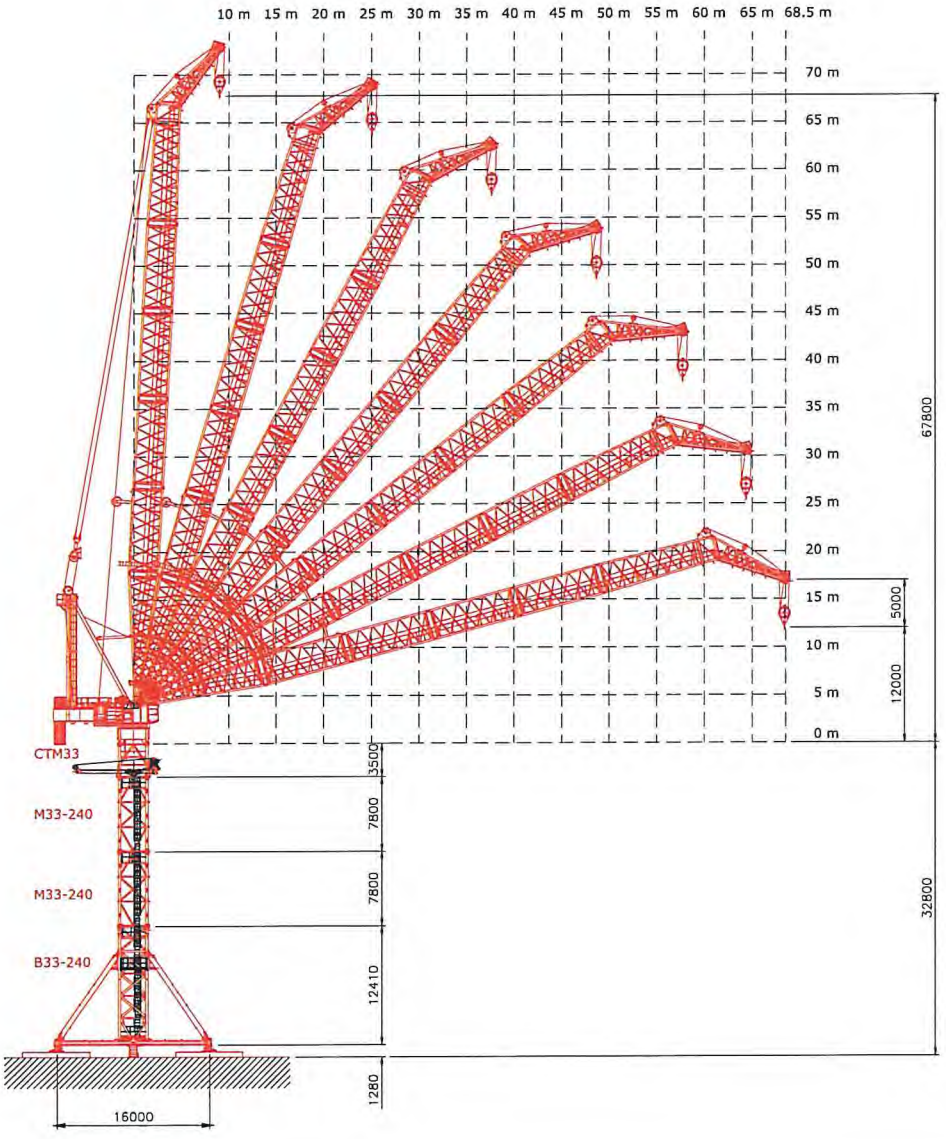
KRØLL CRANES A/S
NORDKRANVEJ 2 · 3540 LYNGE · DENMARK

DRAWING NO.: C1-08.00061770-02

R:\Tegning\Master\CT33\61770 CT33 Main assembly idw 20-08-2015 10:07

K1500L – Heights under hook

	Boom length: 68.5 m														
Radius	9	10	12.5	15	20	25	30	35	40	45	50	55	60	65	68.5
2 x M33	100.6	100.5	100.1	99.6	98.3	96.7	94.5	91.9	88.7	84.9	80.2	74.6	67.1	56.9	44.8
3 x M33	108.4	108.3	107.9	107.4	106.1	104.5	102.3	99.7	96.5	92.7	88.0	82.4	74.9	64.7	52.6
4 x M33	116.2	116.1	115.7	115.2	113.9	112.3	110.1	107.5	104.3	100.5	95.8	90.2	82.7	72.5	60.5
5 x M33	124.0	123.9	123.5	123.0	121.7	120.1	117.9	115.3	112.1	108.3	103.6	98.0	90.5	80.3	68.2
6 x M33	131.8	131.7	131.3	130.8	129.5	127.9	125.7	123.1	119.9	116.1	111.4	105.8	98.3	88.1	76.0
7 x M33	139.6	139.5	139.1	138.6	137.3	135.7	133.5	130.9	127.7	123.9	119.2	113.6	106.1	95.9	83.8
8 x M33	147.4	147.3	146.9	146.4	145.1	143.5	141.3	138.7	135.5	131.7	127.0	121.4	113.9	103.7	91.6
9 x M33	155.2	155.1	154.7	154.2	152.9	151.3	149.1	146.5	143.3	139.5	134.8	129.2	121.7	111.5	99.4
10 x M33	163.0	162.9	162.5	162.0	160.7	159.1	156.9	154.3	151.1	147.3	142.6	137.0	129.5	119.3	107.2
11 x M33	170.8	170.7	170.3	169.8	168.5	166.9	164.7	162.1	158.9	155.1	150.4	144.8	137.3	127.1	115.0
12 x M33	178.6	178.5	178.1	177.6	176.3	174.7	172.5	169.9	166.7	162.9	158.2	152.6	145.1	134.9	122.8



E.T Blatt

K1500L – Detailed load chart

Radius [m]	Boom angle [deg]	SWL [tons]	Radius [m]	Boom angle [deg]	SWL [tons]	Radius [m]	Boom angle [deg]	SWL [tons]
9,0	87,0	125,0	29,0	69,8	40,2	49,0	49,6	13,1
9,5	86,6	125,0	29,5	69,3	39,1	49,5	49,0	12,7
10,0	86,2	125,0	30,0	68,9	37,9	50,0	48,4	12,3
10,5	85,8	125,0	30,5	68,4	36,9	50,5	47,8	12,0
11,0	85,3	125,0	31,0	67,9	36,0	51,0	47,2	11,6
11,5	84,9	125,0	31,5	67,5	35,0	51,5	46,6	11,2
12,0	84,5	125,0	32,0	67,0	34,0	52,0	46,0	10,9
12,5	84,1	125,0	32,5	66,6	33,0	52,5	45,4	10,5
13,0	83,7	120,5	33,0	66,1	32,2	53,0	44,8	10,2
13,5	83,2	116,0	33,5	65,6	31,3	53,5	44,1	9,8
14,0	82,8	111,5	34,0	65,1	30,5	54,0	43,5	9,5
14,5	82,4	107,0	34,5	64,7	29,7	54,5	42,8	9,2
15,0	82,0	102,5	35,0	64,2	28,8	55,0	42,2	8,8
15,5	81,6	98,8	35,5	63,7	28,1	55,5	41,5	8,5
16,0	81,1	95,1	36,0	63,2	27,3	56,0	40,8	8,2
16,5	80,7	91,4	36,5	62,8	26,6	56,5	40,1	7,9
17,0	80,3	87,7	37,0	62,3	25,9	57,0	39,4	7,6
17,5	79,9	84,0	37,5	61,8	25,2	57,5	38,7	7,3
18,0	79,4	81,2	38,0	61,3	24,5	58,0	37,9	7,0
18,5	79,0	78,4	38,5	60,8	23,9	58,5	37,2	6,8
19,0	78,6	75,7	39,0	60,3	23,2	59,0	36,4	6,5
19,5	78,1	72,9	39,5	59,8	22,6	59,5	35,6	6,2
20,0	77,7	70,1	40,0	59,3	22,0	60,0	34,8	5,9
20,5	77,3	68,0	40,5	58,8	21,4	60,5	34,0	5,7
21,0	76,8	65,8	41,0	58,3	20,8	61,0	33,2	5,4
21,5	76,4	63,7	41,5	57,8	20,3	61,5	32,3	5,2
22,0	76,0	61,5	42,0	57,3	19,7	62,0	31,4	4,9
22,5	75,5	59,3	42,5	56,7	19,1	62,5	30,5	4,7
23,0	75,1	57,6	43,0	56,2	18,6	63,0	29,5	4,4
23,5	74,7	55,9	43,5	55,7	18,1	63,5	28,6	4,2
24,0	74,2	54,2	44,0	55,2	17,6	64,0	27,5	4,0
24,5	73,8	52,4	44,5	54,6	17,1	64,5	26,5	3,8
25,0	73,4	50,7	45,0	54,1	16,6	65,0	25,4	3,5
25,5	72,9	49,3	45,5	53,5	16,2	65,5	24,2	3,3
26,0	72,5	47,9	46,0	53,0	15,7	66,0	22,9	3,1
26,5	72,0	46,5	46,5	52,4	15,3	66,5	21,6	2,9
27,0	71,6	45,1	47,0	51,9	14,8	67,0	20,2	2,7
27,5	71,1	43,7	47,5	51,3	14,4	67,5	18,6	2,5
28,0	70,7	42,5	48,0	50,8	13,9	68,0	16,8	2,3
28,5	70,2	41,4	48,5	50,2	13,5	68,5	15,0	2,1

7 Blatt

K1500L weights, 179 m hook height

Top crane including slew mount		:	**232 tons**
Tower sections and foundation plates		:	**347 tons**
Total crane weight		:	**579 tons**

Deck assembly		68,9 tons
Deck	25,2	
Slew mount	9,5	
Slew ring and bolts	3,3	
Hoist winch	11,0	
Hoist wire	6,6	
Luff winch	4,8	
Luff wire	1,3	
Slew drives	0,6	
Driver's cabin assy	4,9	
Misc.	1,7	
Counterweight		100,0 tons
Counterweights	100,0	
Toptower/Mast assembly		15,2 tons
Legs	10,6	
Pulleys	1,4	
Buffer	0,9	
Platforms/ladder	0,8	
Misc.	1,5	
Boom, 69 m		31,4 tons
Inner	5,6	
Extension	4,3	
Extension	3,3	
Extension	3,3	
Extension	3,3	
Top	5,8	
Tip	4,5	
Misc.	1,5	
Boom, tagline winch additions		8,9 tons
Tagline system	8,9	
Bridle		2,5 tons
Bridle w/connectors	2,5	
Pendants		1,9 tons
44 mm ropes, 4 pcs	1,6	
Connectors	0,3	
Hook block		3,3 tons
Hook block	3,3	

Towers, climbing system and foundation plates			
CTM33	1 pcs	9,3	9,3 tons
CTM33, winch beam	1 pcs	5,6	5,6 tons
CT33 climber	1 pcs	34,2	34,2 tons
M33-240	12 pcs	15,3	183,6 tons
B33-240, cross and legs	1 pcs	51,5	51,5 tons
Pyramids	4 pcs	1,6	6,4 tons
Foundation plates	4 pcs	14	56 tons
Total			346,6 tons

8 Blatt

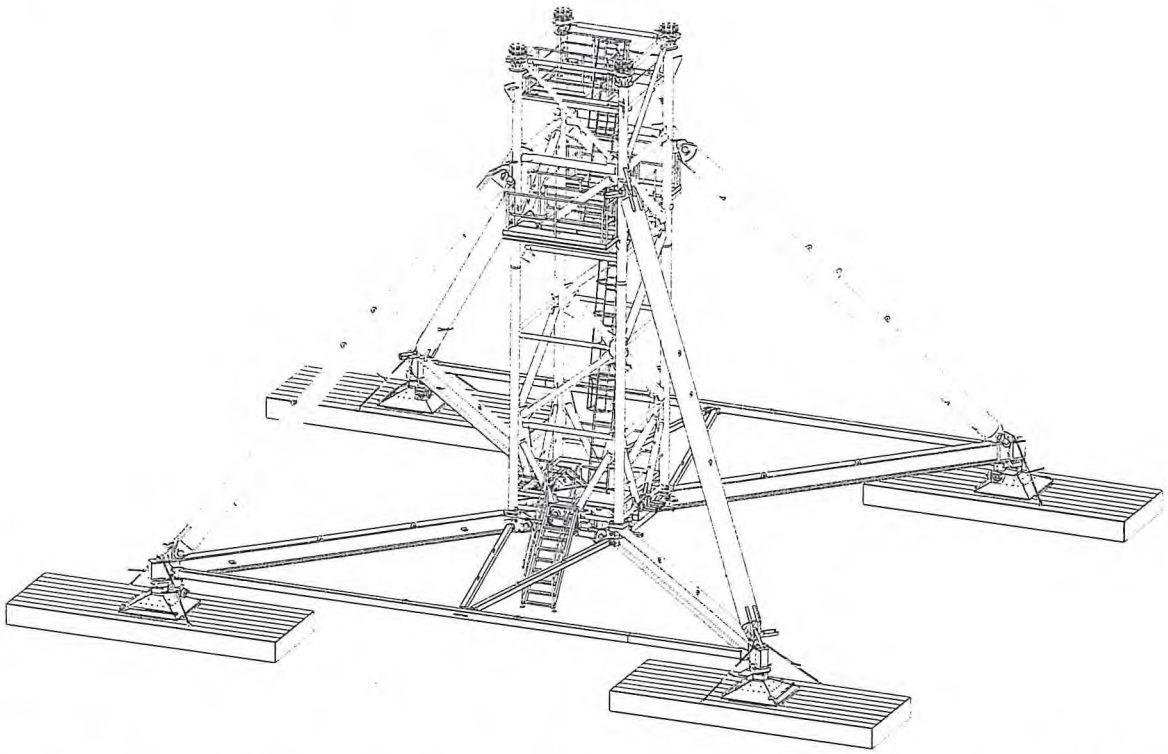
3. Blatt

10 Blatt

11 Blatt

1. ASSEMBLY OF BASE MAST B33

Refer to drawings: C1-01.00061660 B33, pyramids and foundation plate assembly



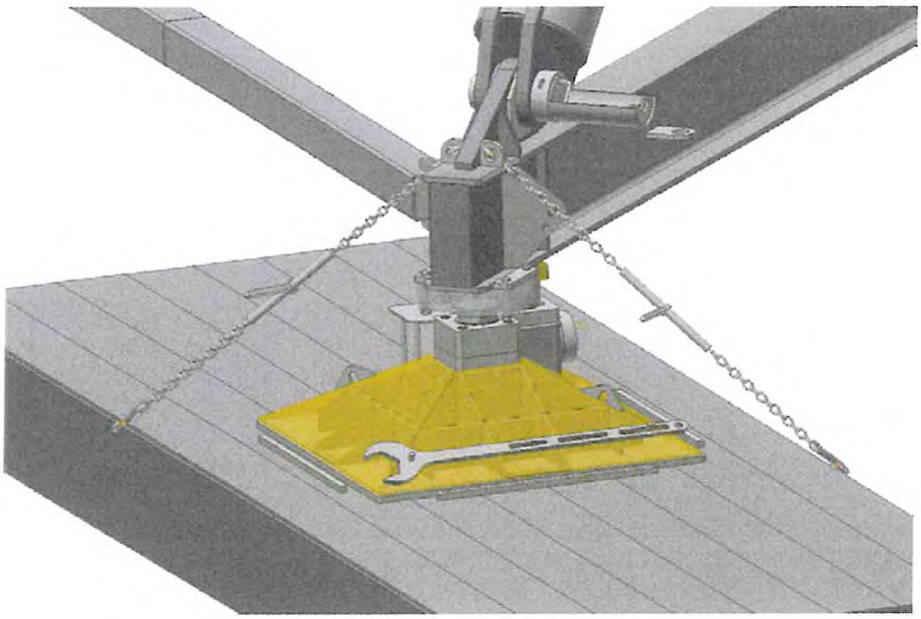
- The four load distribution plates (7.0 x 2.4 m) are placed on relatively plane ground in a 16.0 x 16.0 m square. The level differences should be within 300 mm corresponding to approx. 2% ground slope.

- Pyramids with integrated hydraulics are placed on top of the load distribution plates within the marked area. Make sure the pyramids are placed in a 16.0 x 16.0 m square. The diagonal distance is theoretically 22.627 m.

- The bottom cross assembled on top of the pyramids. A support at the centre will be needed to prevent deflection. Support capacity at least 40 tons.
  Also fit the two side beams, the four lattice rod and the four centre horizontals with pin connections for the bottom mast.

- Use the hydraulics on the pyramids to level the bottom cross.
  After jacking the cross in the corners as necessary, the big wrench (parked on the pyramids) is used to turn the spindle and make contact with the bottom cross.
  The jacking cylinder has a stroke of 50 mm. If more level adjusting is needed, it must be carried out in several steps.
  When all corners are levelled, retract the jacking cylinders, so there is no contact to the bottom cross.

- Fit chains between the bottom cross and the load distribution plates. Use the turnbuckles to tighten the chains.



- Fit the bottom mast B33 onto the bottom cross.
  Fit 8 pcs 2.25" bolts between corner members and bottom cross (to not torque tighten).
  Fit 8 pcs pins to the horizontals. The pin areas are prepared with supports for hydraulic tools to aid pushing or retracting the pins.

- Fit the four supporting legs between the bottom cross and the top of the B33 mast.
  Fit the pins.

- All bolts are torque tightened to 100 %.
  The support under the bottom cross centre is removed.
  Secondary equipment (remaining ladders, entry stairway, etc.) is fitted.

- The assembly of the B33 bottom mast system is now completed.

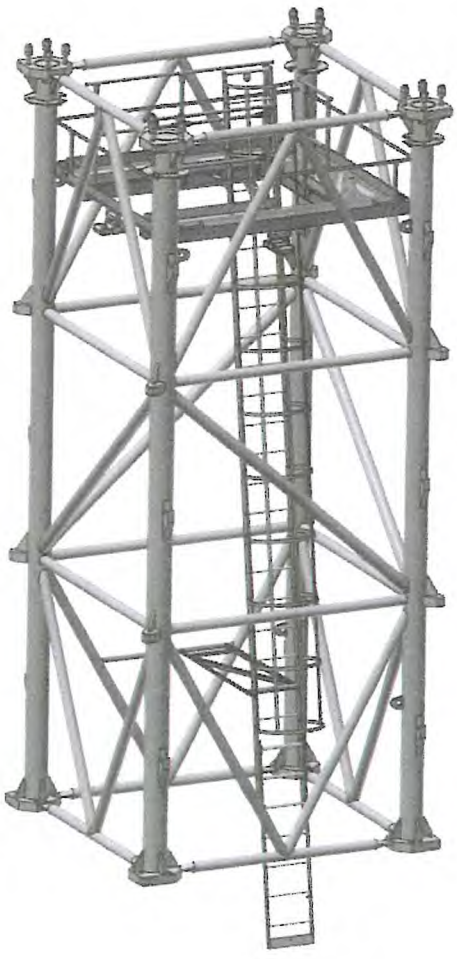
Assembled weight : approx. 66 tons (without load distribution plates)

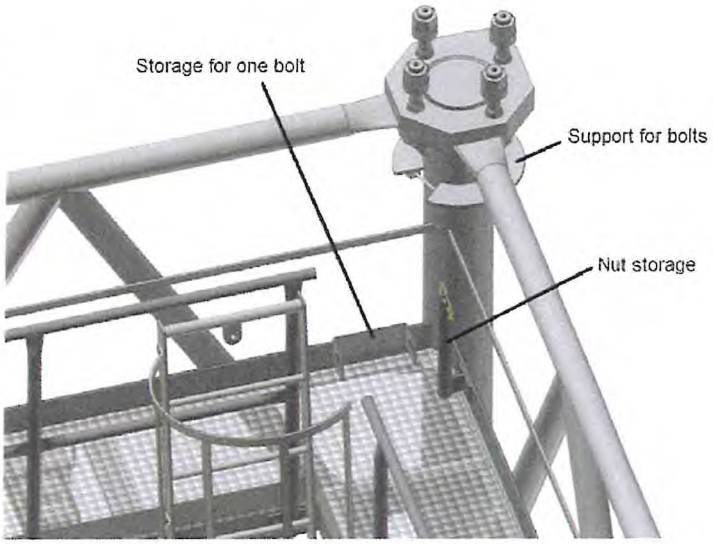
2. PRE-ASSEMBLY OF M33 MAST SECTIONS

Refer to drawings: C1-01.00061640 M33-240/8 (8 bolts per corner)
C1-01.00061641 M33-240/4 (4 bolts per corner)

- The tower sections come fully welded with platforms and ladders prefitted. The bottom part of the ladder is slidable, so it can fit within the tower section and get pulled out after installation of the tower section.

- The tower is prepared with storage facilities for the 2¼" mast bolts and nut.
  Support for bolts: The bolts will rest on a plate around the corner and ready to be pulled up, when the next tower section is fitted on top.
  Storage for one bolt: One bolt is parked away for the bolts support since the inner hole is used as a guide pin when the next tower section is fitted.
  Nut storage: There is space for 4 nuts on a nut storage tube





- Two tower sections are fitted on top of the base mast B33.

  Weight per M33-240 : 15.5 tons

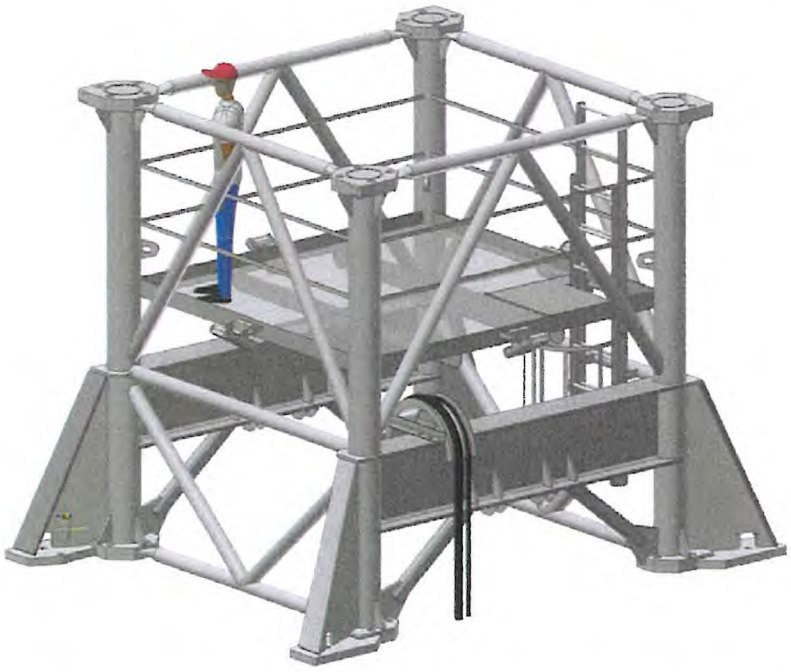
- Slide out the ladders.
- The 2¼" mast bolts are torque tightened to 2950 Nm, see info 5498-03 for instructions.

3. PRE-ASSEMBLY OF CTM33 CLIMBING FRAME

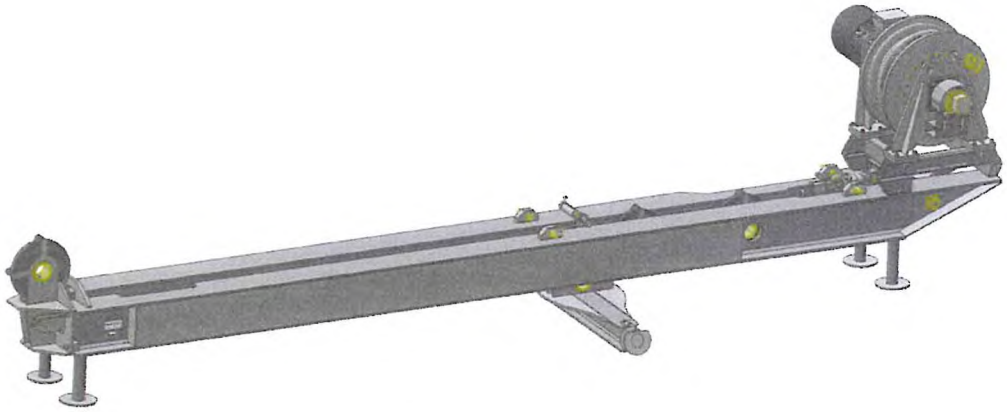
Refer to drawings: C1-01.00061814 CTM33 assembly
C1-01.00061830 Erection beam with hoist winch

- The CTM section comes fully welded with platforms and ladders prefitted. The bottom part of the ladder is slidable, so it can fit within the tower section and get pulled out after installation of the tower section.

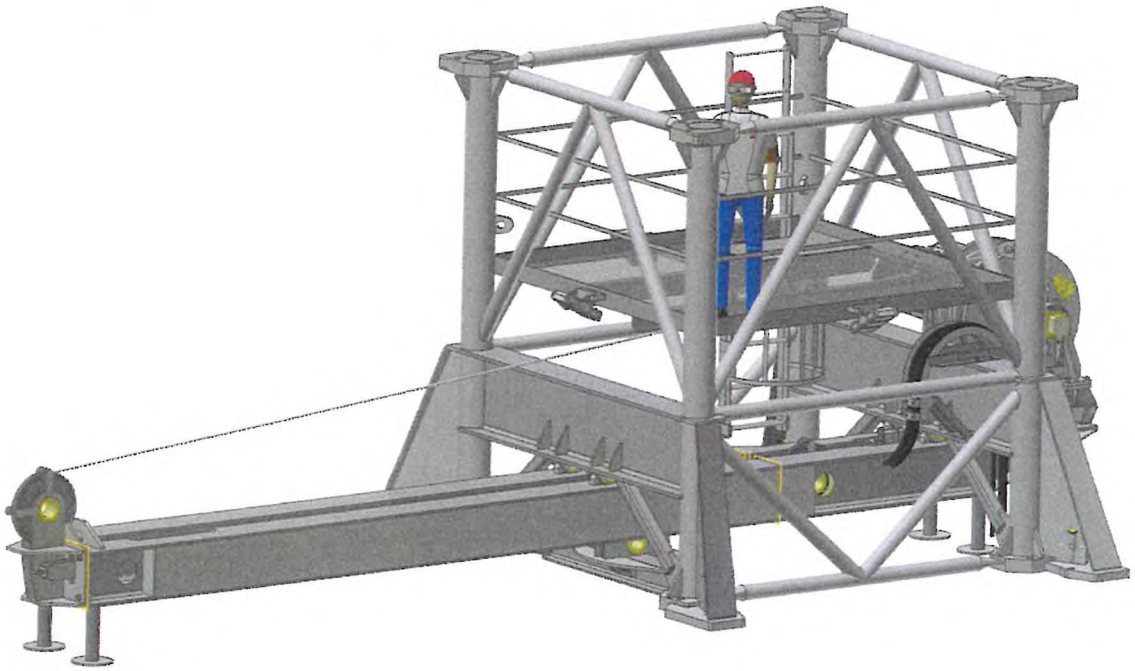
- Make sure that all equipment is fitted including the cable relief bracket.



- Preassemble the erection beam including the hoist winch. Park the trolley as shown where it can be fixed using the pin on top of the beam. Reeve the trolley rope.



- Suspend the erection beam under the CTM33 using the four pins.
  Reeve the hoist rope from the drum through the CTM33.



The CTM33 and erection beam system is now prepared for fitting.

Assembled weight : Approx. 16.0 tons

4. ASSEMBLY OF CT33 CLIMBING SECTION

Refer to drawing: C1-01.00061770 CT33 main assembly

- Start assembling both side panels consisting of:
  1. Bottom panel with cylinder support
  2. Short intermediate panel
  3. Long upper panel
  4. Diagonal lattice work (7 pcs per side)

- Fit the
  1. Cylinders to the bottom panels
  2. The fixed claws to the bottom panels
  3. The movable yoke to the cylinder top

- Using the handle around the cylinders pull the movable yokes "outwards" until they lean against the support rails.
  Fix the yokes to keep them in place.

- Raise the side panels and connect them with:
  8 pcs horizontal H-beams (4 at the front, 4 at the back)
  9 pcs diagonals (6 at the front, 3 at the back)

- Before tigtening all the bolts, check the overall dimensions of the assembled section.
  Check especially:

  Distance between the top Ø52 holes is 3895x3315 mm

  Distance between the guide rails for the tower sections is 3315 x 3315 mm leaving 7.5 mm clearance for the tower sections

- Fit the ladders.
- Fit the platforms
- Fit the pump station with platform
- Fit hydraulic hoses and equipment.
- The assembled CT33 is now ready to be fitted.
  Weight of CT33 complete : 33.0 tons

5. BUILDING THE TOWER TO INITIAL HEIGHT

The B33 bottom mast is prepared with supports for the CT33 climbing section.

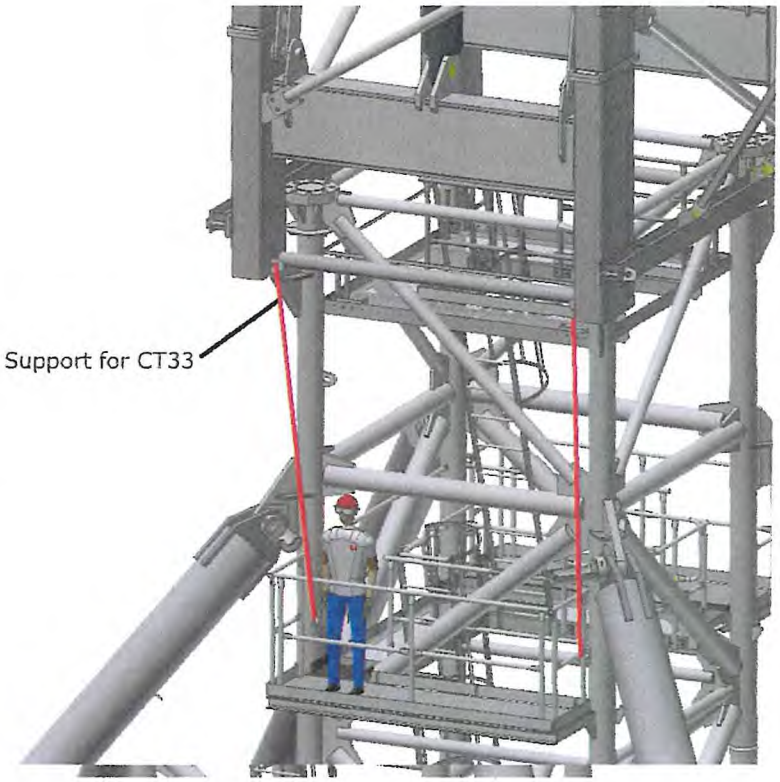
Lift the CT33 – using the temporary lifting yokes on top of the CT33 – and fit the CT33 on the supports on B33.

Since there is no M33 towers on top of the B33 to support the CT33, the CT33 is resting in a insecure way.

Secure the CT33 by fitting 4 pcs 10t chains between the lugs on the CT33 to lugs on the outside of the B33 at the platform level.

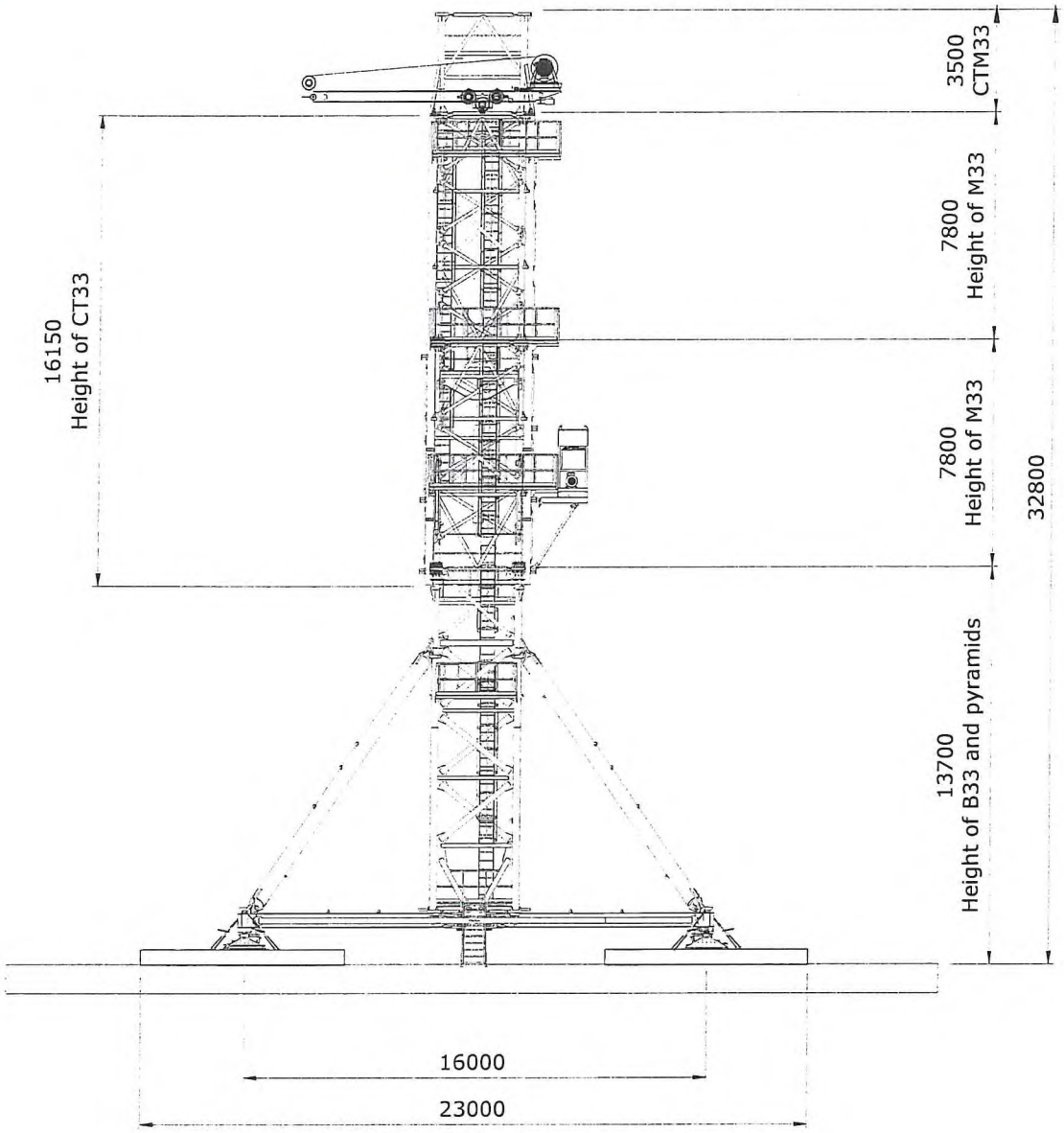
The chain positions is marked with red on the drawing.

2 pcs M33 towers can be fitted before fitting the CT33. They will support the CT33 with no need for the chains.
This erection alternative will, however, require more lifting height to fit the CT33 around the tower.



- Fit – one by one – two pcs M33-240/8 towers inside the CT33.
  Fit all 2,25" bolts and torque tighten to 100%.

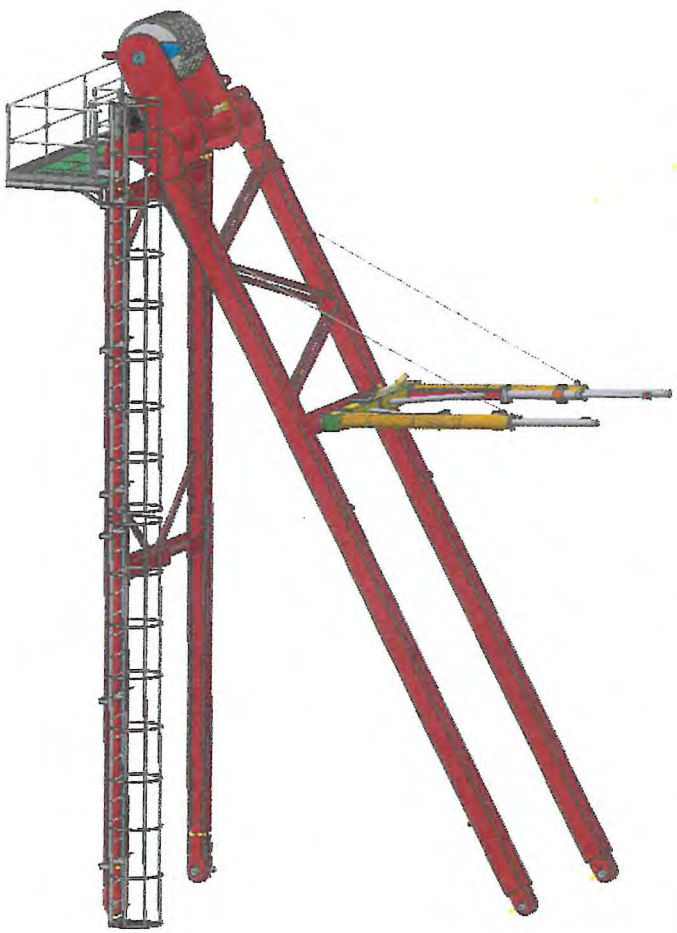
- Fit the CTM33 with erection beam to the top of the tower.

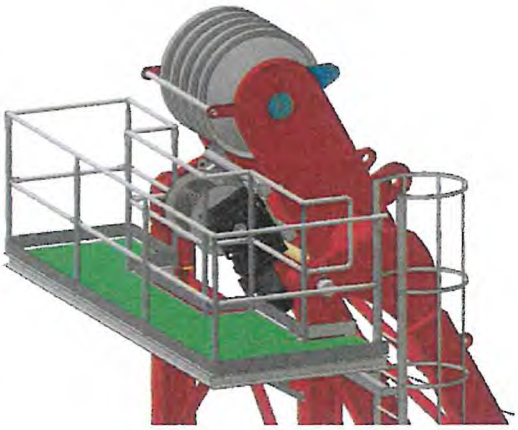

3500
CTM33
7800
Height of M33
16150
Height of CT33
7800
Height of M33
32800
13700
Height of B33 and pyramids
16000
23000

6. TOPTOWER ASSEMBLY

Refer to drawing: P3000-0024-X00 Toptower assembly
C2-04.00063819 Erection winch assembly

- Pre-assemble the toptower according to the assembly drawing.
- Fit the erection winch at the top just under the sheaves.
  Also fit the wire roller in front of the sheaves and the wire roller on the buffer bracket, both to protect the structures against hanging luffing wires during erection of the crane.
  Fit the wire guide roller under the erection winch.





The toptower is now ready and prepared for fitting on the deck.

Assembled weight : Approx. 17.5 tons (including erection winch)

7. DECK AND MASTHEAD ASSEMBLY

Refer to drawings:	C1-03.00061952	Deck and masthead assembly
	C1-03.00061955	Driver's cabin and suspension assembly
	C1-05.00061715	Hoist winch assembly
	C1-05.00061702	Luff winch assembly
	A5200-0243	Bridle

The deck is supplied with the masthead fitted. If the slew ring is separated from either deck or masthead:

- Each ring on the slew ring has 96 pcs Ø36 holes for M33 bolts.

- Before the greased bolts are torque tightened (2580 Nm), it must be ensured that there is full contact between the slew ring and the counterpart, and it must also be ensured that the bolts are not subject to any external forces during tightening of the bolts.
  It means that the deck must be supported under the tale, since it otherwise will fall over backwards and prevent proper tightening of the bolt.
  If these precausions are not followed, the bolts will either be preloaded inadequately (and reduce slew ring strength) or overtightened (and crack).

When the deck structure, slew ring and masthead is fully bolted together:

- The winches and powerpack are factory-fitted inside the deck.

- Fit the driver's cabin assembly and the right side platform.
- Fit the right and left side platforms near the counterweight area.
- Fit railings.
- Fit the wire roller in front of the deck to prevent structure damage by the hoist wire

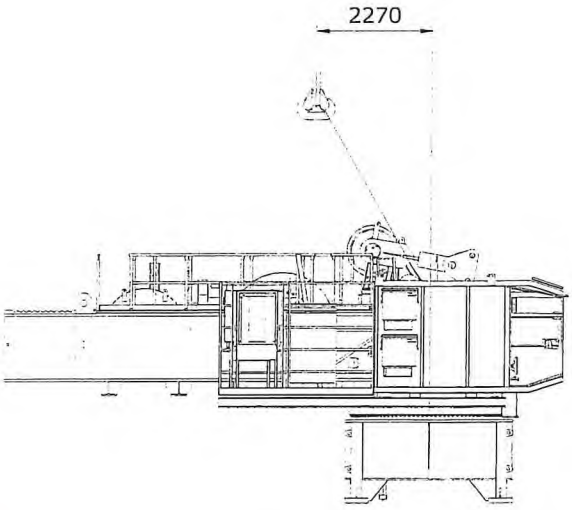
- Fit the bridle on its parking platform.

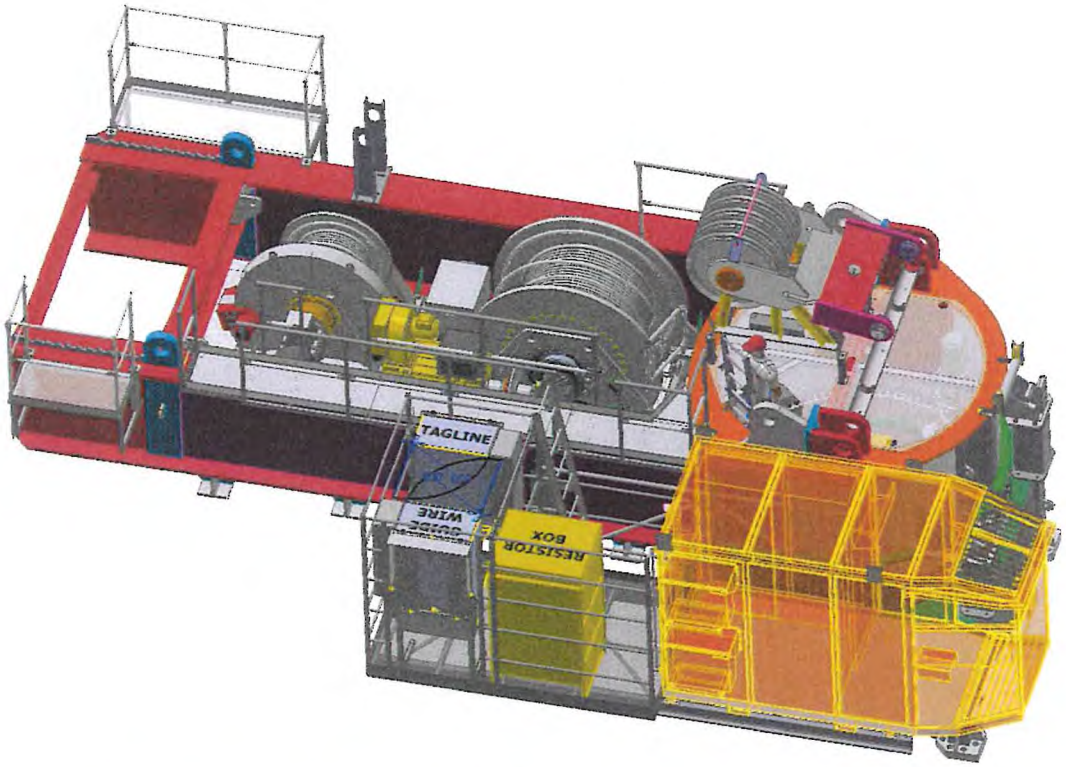
Assembled weight : Approx. 70.0 tons

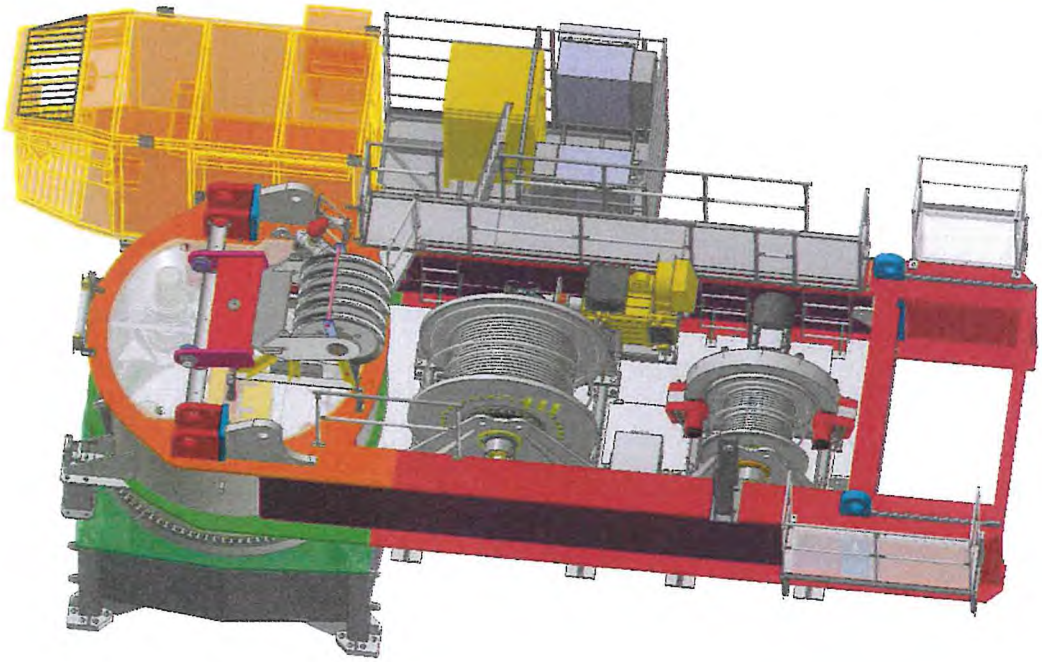
Use 4 slings/chains with SWL: minimum 30 tons.

Left side slings to be 78 cm longer than right side slings (due to cabin side weight)

To avoid side weight and decrease the total weight, the cabin assembly (5 tons) can be fitted separately after the deck is in place.
It is allowed to walk/sit on the cabin roof to remove the slings




TAGLINE
RESISTOR BOX

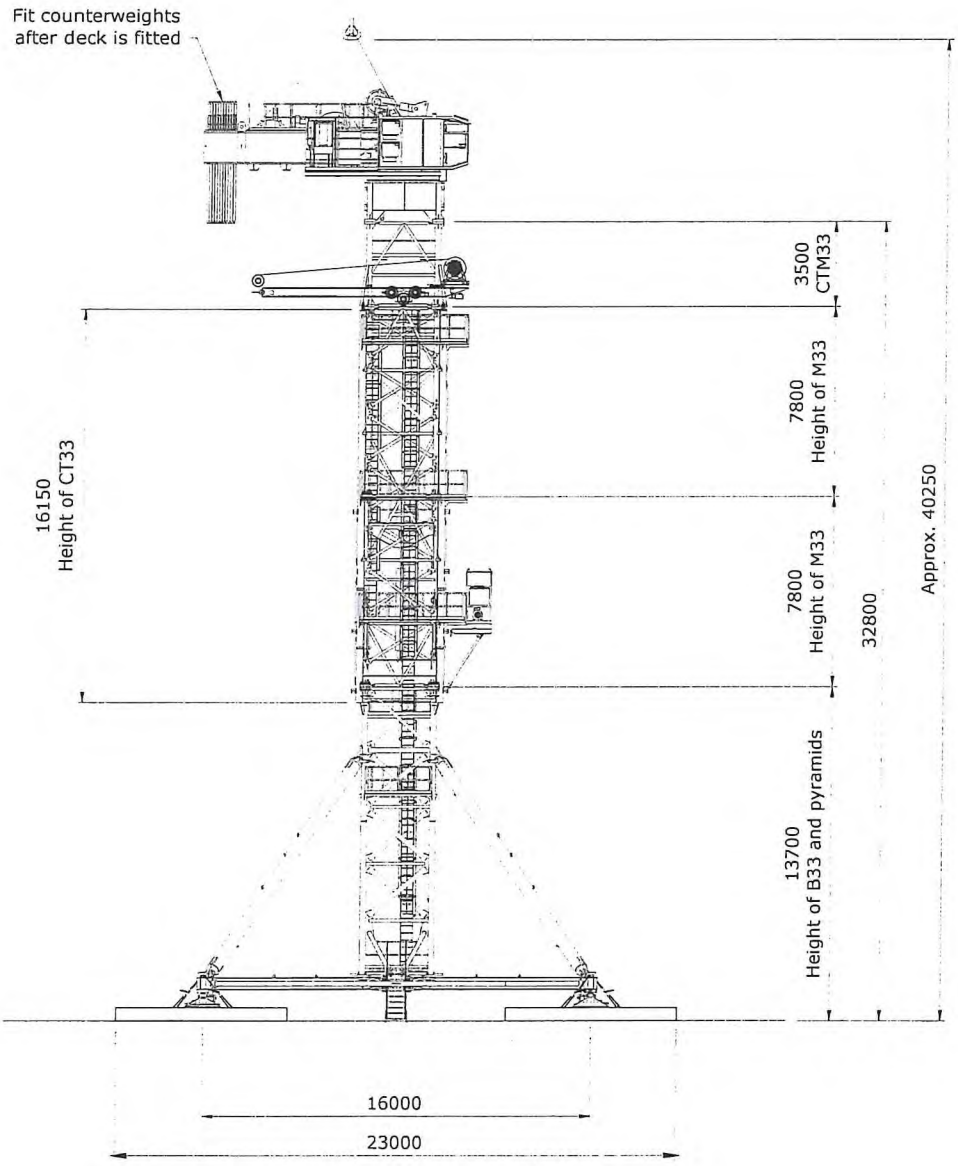


8. FITTING DECK AND TOPTOWER TO TOWER

Depending on available mobile crane capacity, the toptower can be fitted to the deck either when the deck is on the ground or fitted to the tower.

Fitting deck and toptower separately

- Lift the deck/masthead assembly and fit it to the tower
- Fit all 2.25" bolts between masthead and tower. Torque tighten to 100%.
- Fit the counterweights, 11 pcs each 9.1 tons.



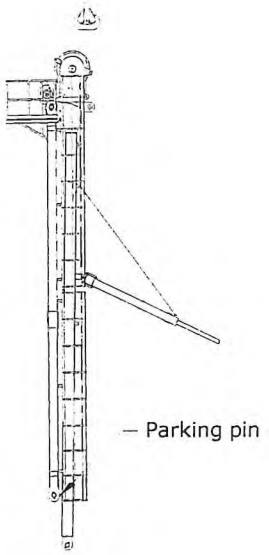
- Lift the folded toptower using the lifting lugs at the thick sheave plates. It will angle slightly backwards.

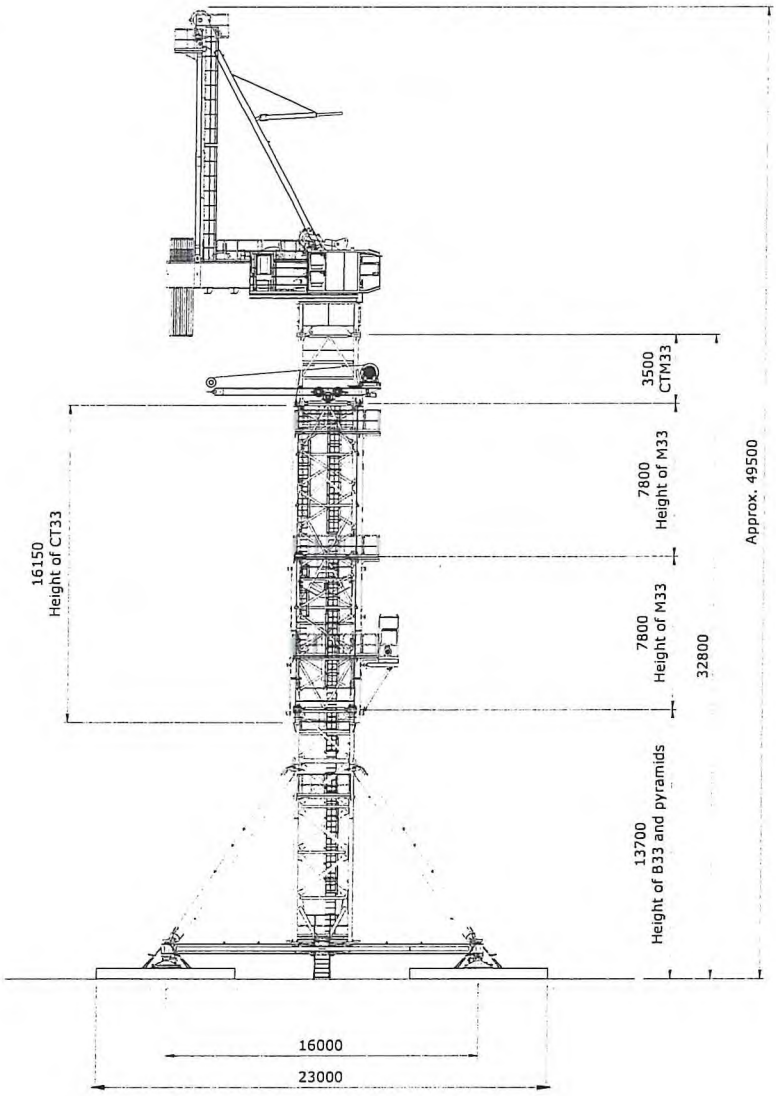
  Use 2 slings with minimum 10 tons SWL

- Fit the front legs to the mast with two pins.
  The pin areas are prepared with supports for hydraulic tools to aid pushing or retracting the pins.

- Remove the parking pin between the front legs and rear legs.

- Let the toptower fall gently backwards until the rear legs also can be pinned to the deck.





Fitting deck and toptower as a unit

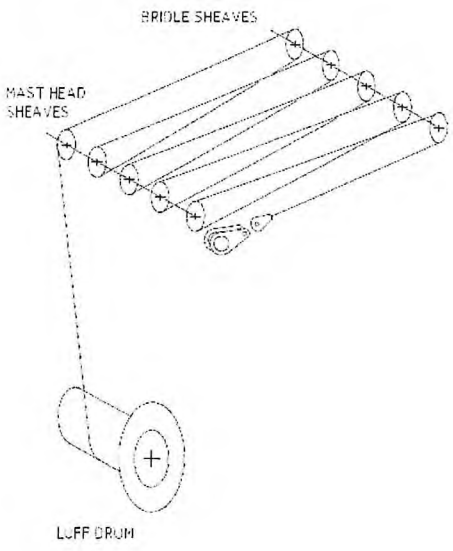
- Fit the toptower to the deck as described above.
- Reeve the luffing wire between the sheaves in the toptower and the bridle on the front deck. Refer to drawing A5000-0493, Luff wire reeving diagram.
  Start reeving the small wire on the erection winch backwards, i.e. pretend the erection drum is the luff anchor (to the right of the toptower sheaves), go through all the sheaves with the right bridle sheave as the first entry, and ending on top of the left sheave on the toptower.
  Connect it to the fast connector on the luffing wire (on the the luff winch).
  Pull the erection wire, which is turn reeves the luffing wire through all the sheaves. Pull until the luffing wire can be fixed to the luff anchor.
- Lift the entire deck/toptower unit to the tower.

(Luffing wires)
(not shown)

Assembled weight :
Approx. 87 tons

Use 4 slings/chains with SWL:
minimum 35 tons.

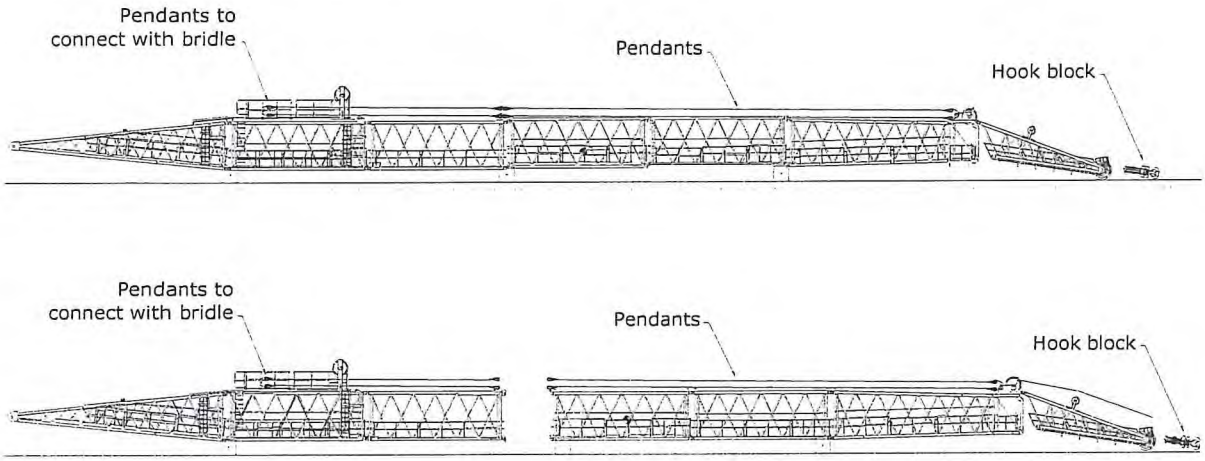
Left side slings to be 78 cm longer than right side slings unless cabin assembly is fitted separately.



9. BOOM ASSEMBLY

Refer to drawings :	P4000-0028-X00	Boom assembly, 69 m
	C1-06.00063550	Hook assembly, 125 tons, 4 parts
	A2175-0505	Rope specification (hoist, luffing, pendant and erection pendant)
	A5600-0409	Pendant link assembly
	A9500-0114	Erection pendants assembly
	A5000-0493	Hoist wire (and luffing wire) reeving diagram

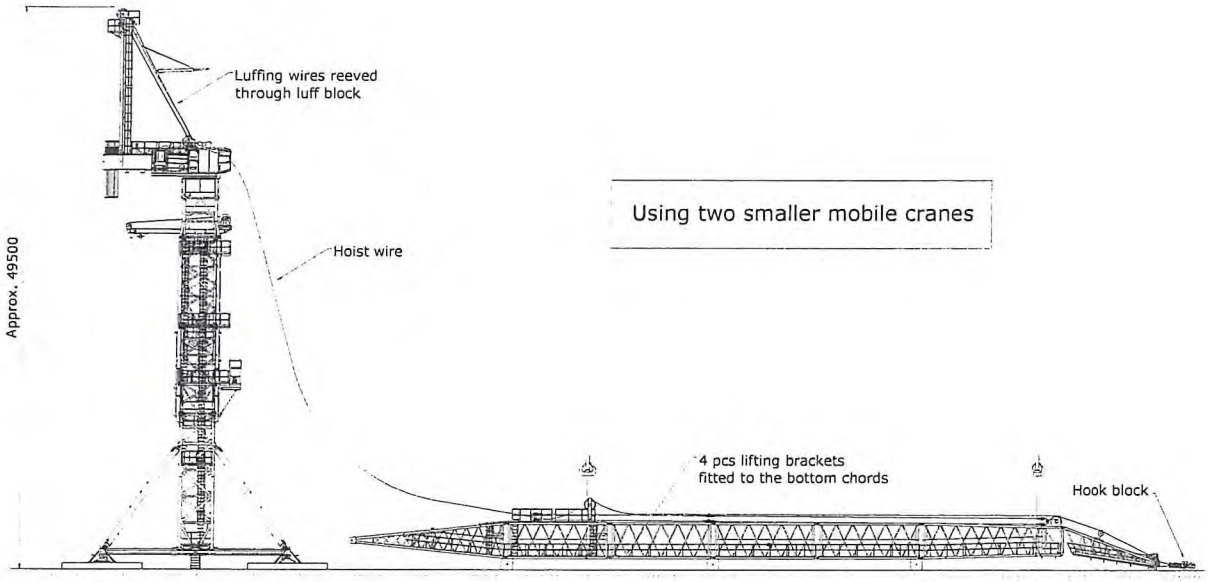
- Complete the boom assembly (7 boom sections) according to the drawing.
  Depending on mobile crane capacity it may be split in two parts consisting of the first 3 sections and the last 4 sections.

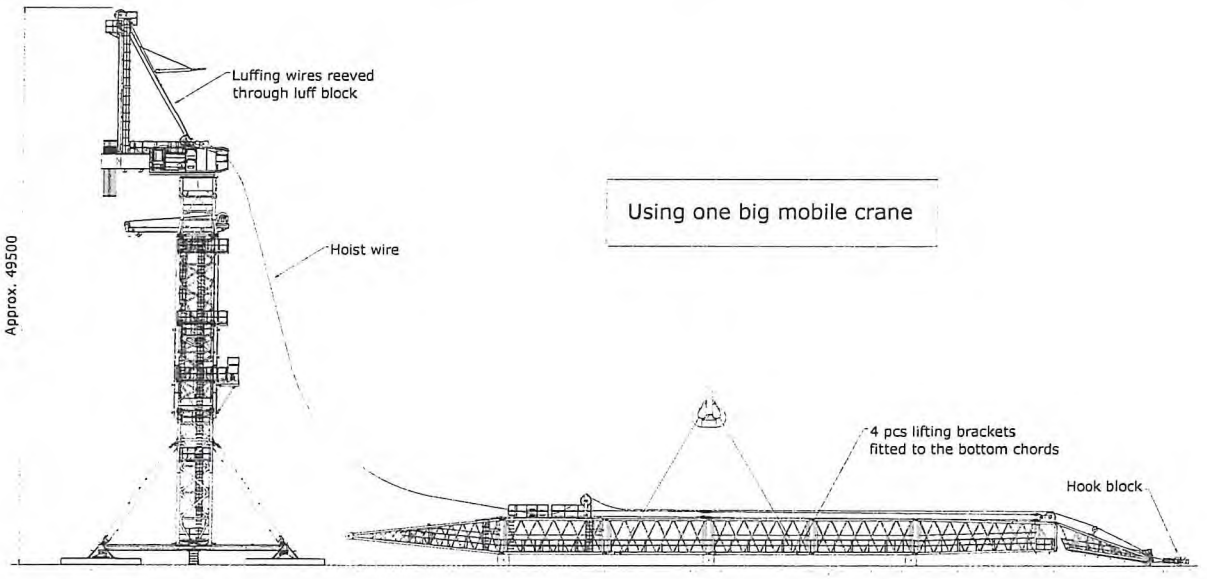


- The tip section is only pinned at the top, while resting with the tip "wheel" on the ground.
- Place the hook block near the tip sheaves.
- Fit the pendants on top of the boom.
- Spool out hoist wire.
  Full boom assembly: Reeve the wire through the sheaves on top of the boom. Reeve it through the hook block (4 falls) and secure it to hoist anchor with swivel.
  Secure the hook to the boom tip using an approx. 5m long sling, so the hook will be lifted together with the boom.

  Split boom assembly: Reeve the wire through the single hoist sheave on top of the boom and let wire hang out over the 3rd boom section.
- The slew brakes may be released if needed (enabled the crane to slew freely).

Fitting the boom in one piece

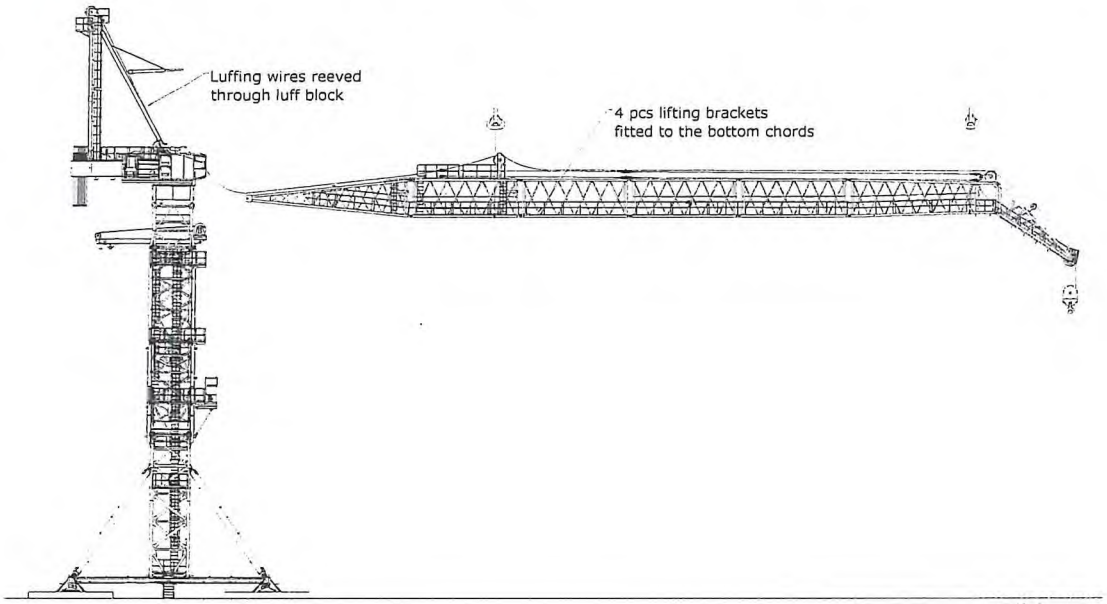




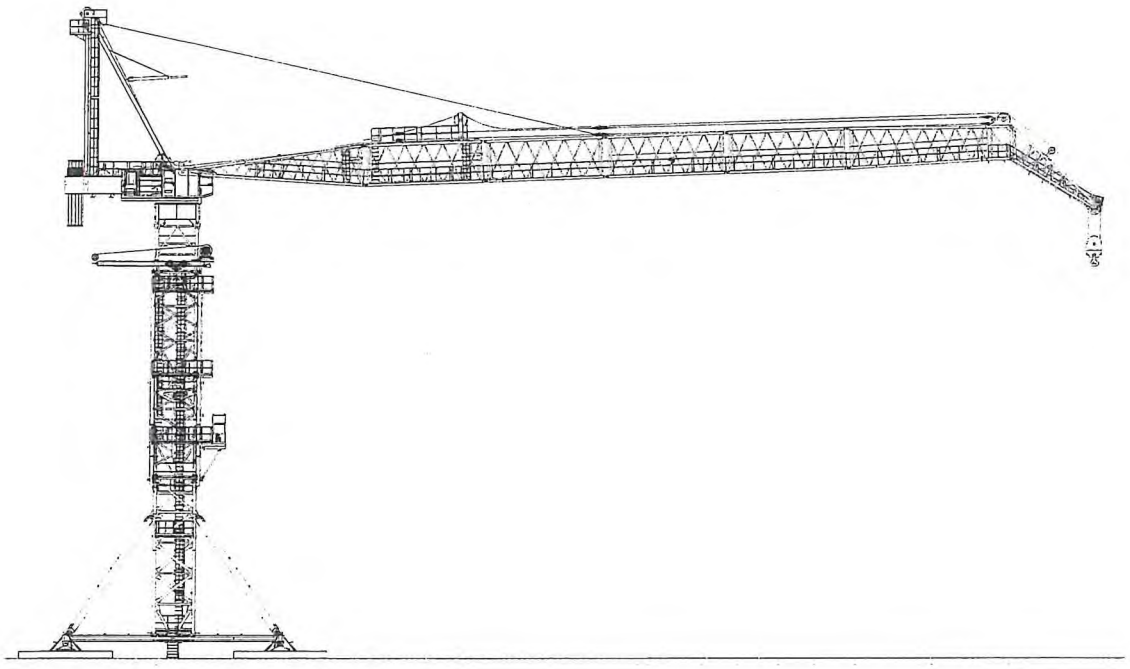
- The boom is now ready to be lifted.
  When using one mobile crane, the lifting points may need adjusting based on a trial lift.

  Total weight of boom, hook, pendants, and tagline winch: 46 tons
  Use 4 slings with minimum 20 tons SWL

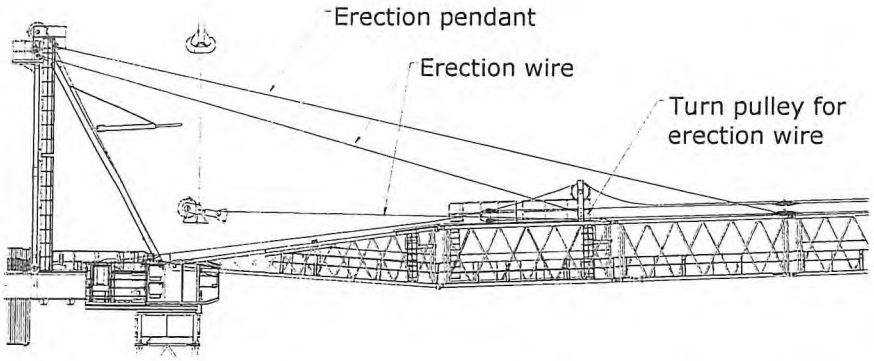
- When lifting the boom just off the ground, the tip section will slide on the ground. Make the bottom pin connections to the previous boom section when possible. Continue lifting the boom to the deck, while spooling-in hoist wire to keep up with the boom lifting pace.



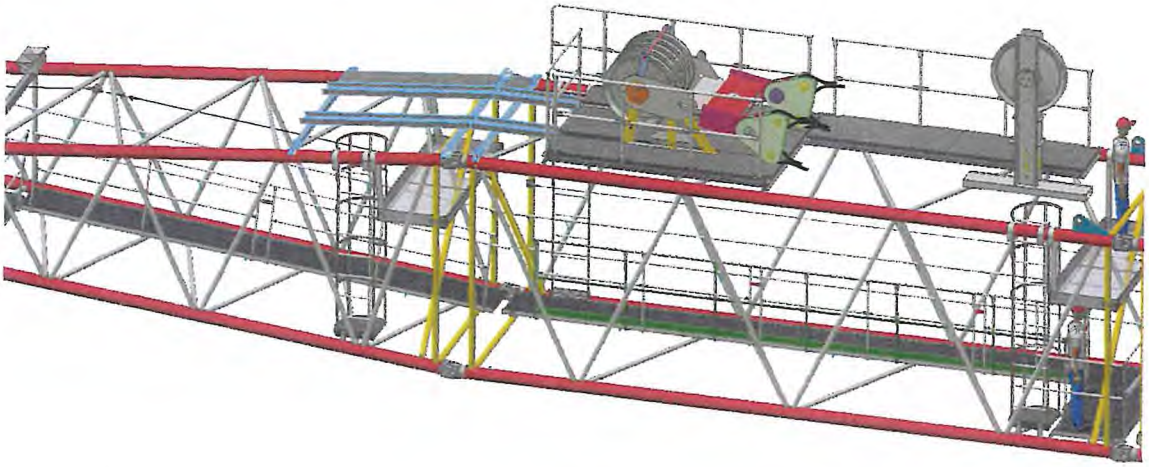
- Fit the boom to the deck using pins. The pin areas are prepared with supports for hydraulic tool to aid pushing or retracting the pins.
- Fit the erection pendant rope. It may be necessary to raise the boom a little.
- Ease off the mobile crane and check that the boom is hanging properly in the erection pendants before it is released from the mobile crane.



- Lift the bridle from the deck to the bridle platform on the boom. The erection winch at the toptower is also used for this operation to help pulling out the bridle while lifting it:



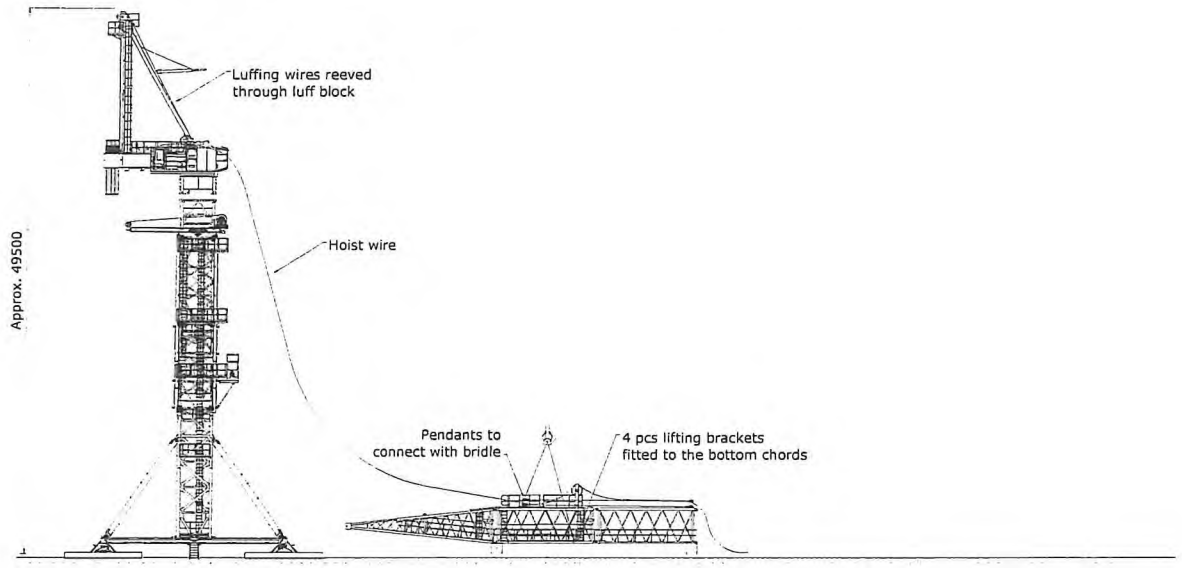
- The inner boom section is prepared with a couple of rails, where the bridle can be placed temporarily and be pulled – by the erection wire – the last few metres to its final destination on the boom platform ready for connecting to the pendant ropes.



- Connect the bridle to the pendant ropes by pins.
- Operate the luff winch to tighten the luff wires and pendants.
- Operate the hoist winch to tighten the hoist wire. Release the hook from the tip.

Fitting the boom in two pieces

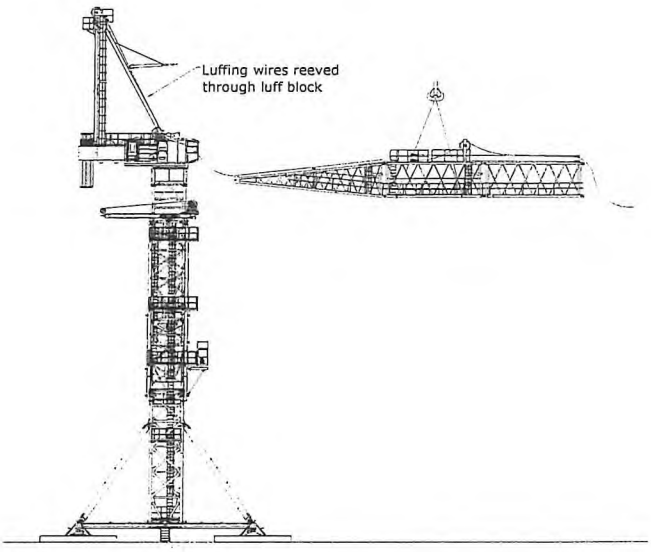
- The hoist wire is reeved and prepared for the outer sections.



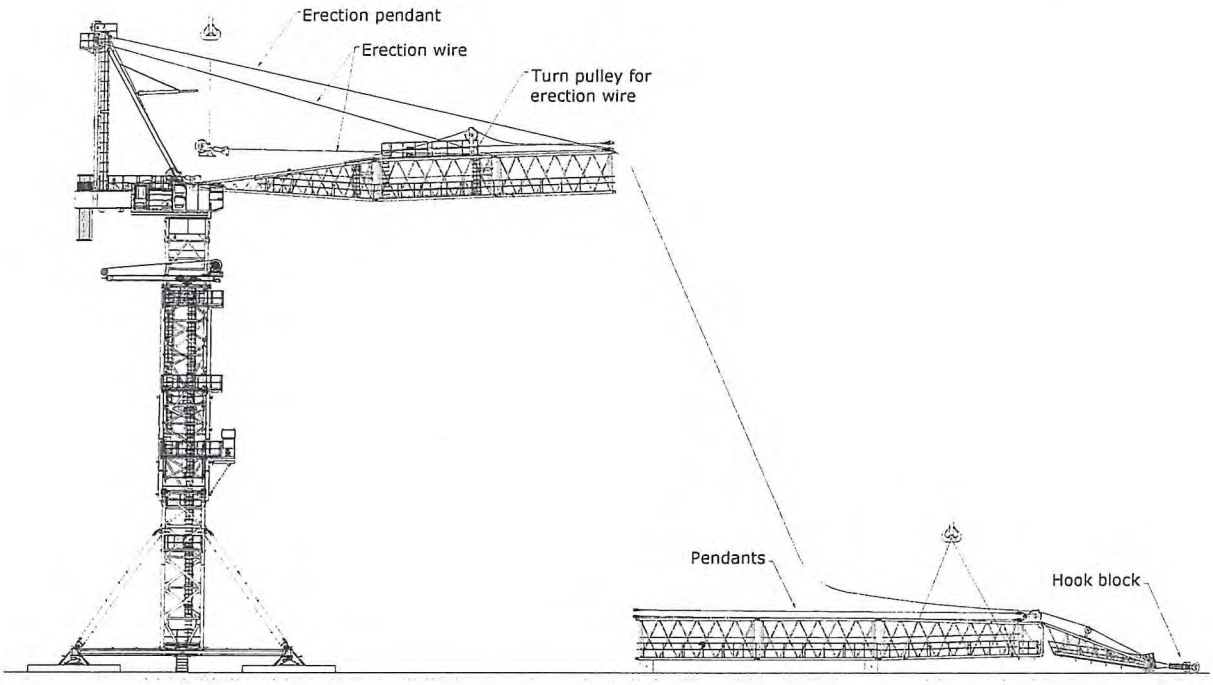
- The boom is ready to be lifted.

  Total weight of boom, hook, pendants, and tagline winch: 23 tons
  Use 4 slings with minimum 10 tons SWL

- Lift the boom, while spooling-in hoist wire to keep up with the lifting pace.
- Connect the boom to the deck, fit the erection pendants and move the bridle to the boom platform as described above (fitting the boom in one piece).

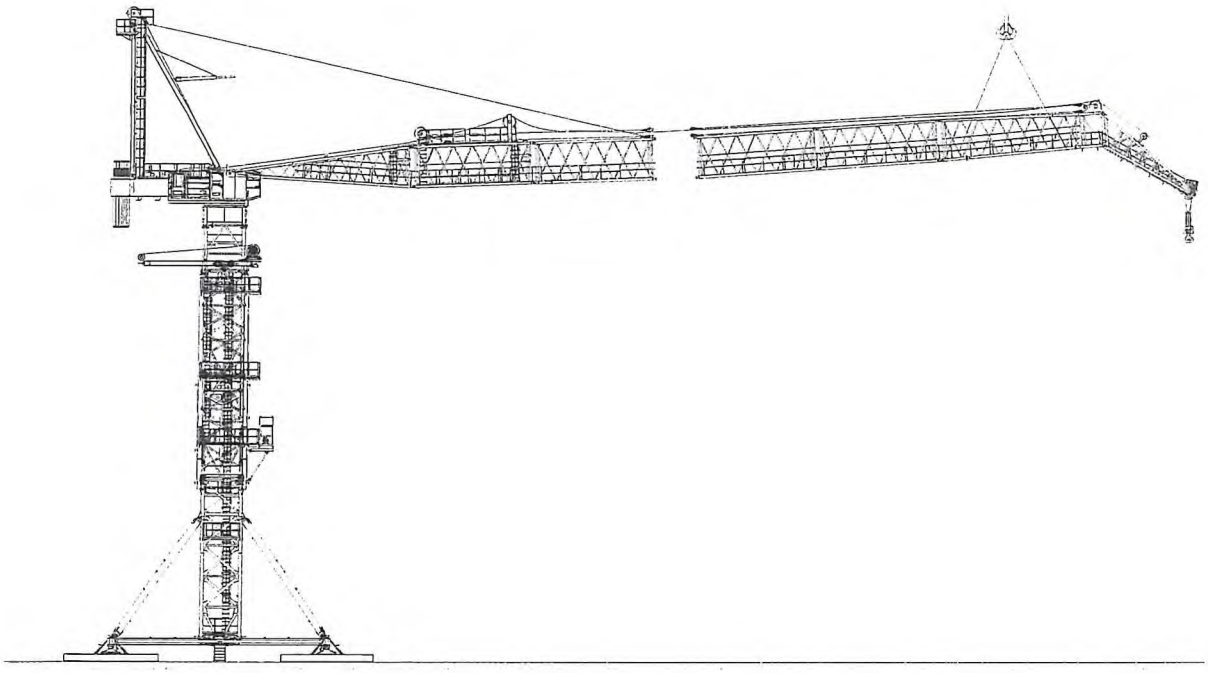


- Reeve the hoist wire through the sheaves on top of the remaining grounded boom sections. Reeve it through the hook block (4 falls) and secure it to hoist anchor with swivel. Secure the hook to the boom tip using an approx. 5m long sling, so the hook will be lifted together with the boom.



- The outer boom sections are now ready to be lifted.

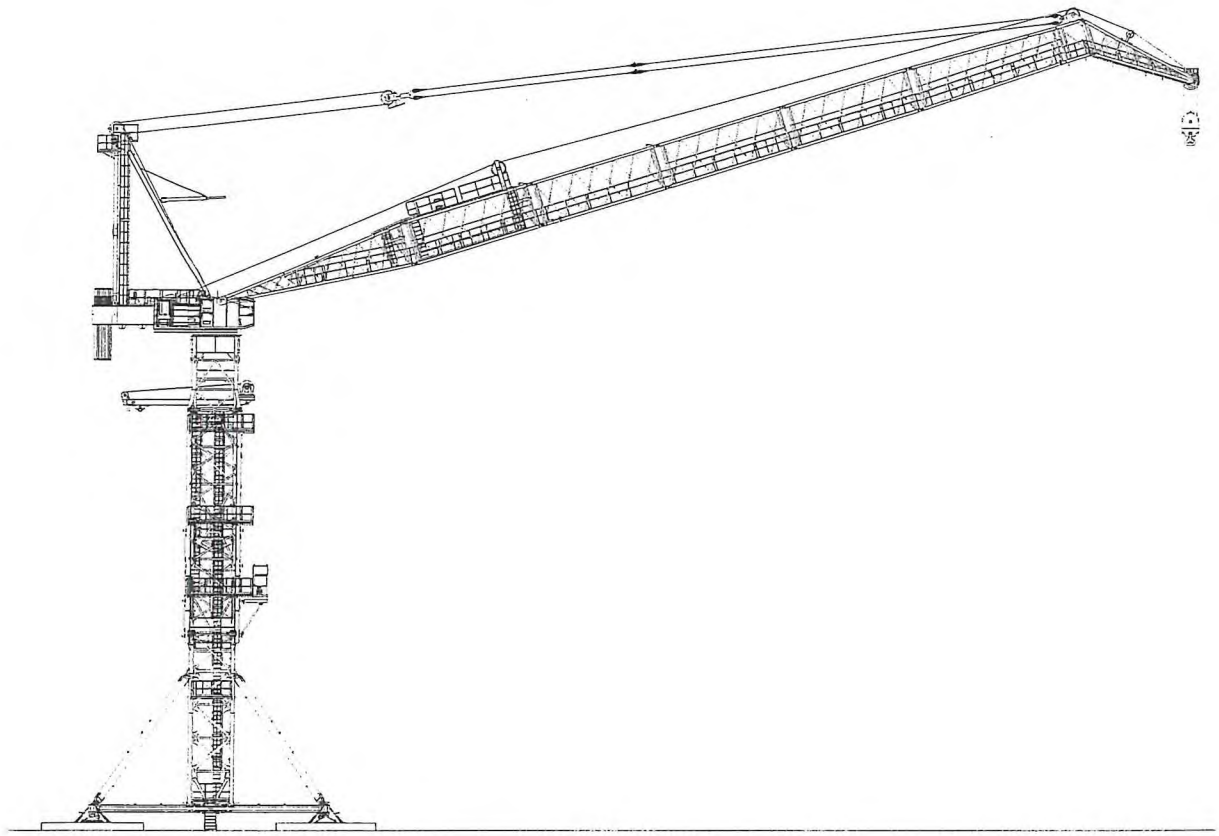
  Total weight of boom, hook, pendants, and tagline winch: 23 tons
  Use 4 slings with minimum 10 tons SWL



- Fit the boom outer sections to the already fitted sections.
- Easy of the mobile crane gently checking that the outer boom sections are hanging properly.
- Operate the hoist winch to tighten the hoist wire. Release the hook from the tip.

10. FINAL STAGES

- Make up remaining electrical connections.
- Check settings of the hoist and luff limits. At first erection the limits must be set.
- Check the radius reading is correct. At first erection the radius reading must be set.
- Check the load indication is correct. At the first erection the load indication must be set by test loading the crane
- Carry out an inspection. Check all connection bolts for 100% torque.
- Check all motions.



- Climb to the required hook height (see section 11).
- The crane is ready for operation.
  Maximum wind speed in operation: 15 m/s