



CTT 181/A H20

Tower Installation

“F” - “T”

- 1** **LOADS ON THE GROUND**
- 1.1 INSTALLATION “**F**₁” - “**T**₁” (stationary/travelling crane on 6×6 m / 20×20 ft undercarriage)
- 2** **BASE BALLAST**
- 2.1 PREPARATION
- 2.2 TYPE AND QUANTITY
- 2.2.1 Installation “**F**₁” - “**T**₁”
- 2.2.2 Additional subundercarriage ballast
- 2.3 BASE BALLAST WORKING DRAWINGS
- 2.3.1 Base ballast block **SR “A1”** (7250 kg / 15,986 lbs) - Cod. 390105007
- 2.3.2 Base ballast block **ST “B2”** (4400 kg / 9,702 lbs) - Cod. 390106005
- 3** **BASE SUPPORTS**
- 3.1 INSTALLATION “**T**”
- 3.1.1 Assembling the rail buffers
- 3.2 INSTALLATION “**F**”
- 3.2.1 Placing the anchor bolts
- 3.2.2 Final leveling

1 LOADS ON THE GROUND

The tables show the loads on the ground for the different crane configurations according to the hook height and to the jib range.

In-service and out-of-service base loadings consider the effects of the 2nd Order Theory and comprehend the static and dynamic uprated safety factors, as provided by FEM 1.001 standards

Overturning moment with out-of-service crane may have minus sign, when the counterweight effect prevails that of the wind blowing from the jib rear.



The data shown herein are applicable only to the specific crane configuration indicated. Do not interpolate or extrapolate the data.



Any variation from the prescribed and recommended data and specifications could result in defective foundations and damage to or possible collapse of the tower crane.

The contractor is responsible for damage caused by an incorrectly prepared foundation or by neglecting the site conditions.



As regards the tower configuration for the different crane installations, refer to **Chapter 2 “Technical Specifications”** of the crane operation manual.

TWISTING MOMENT



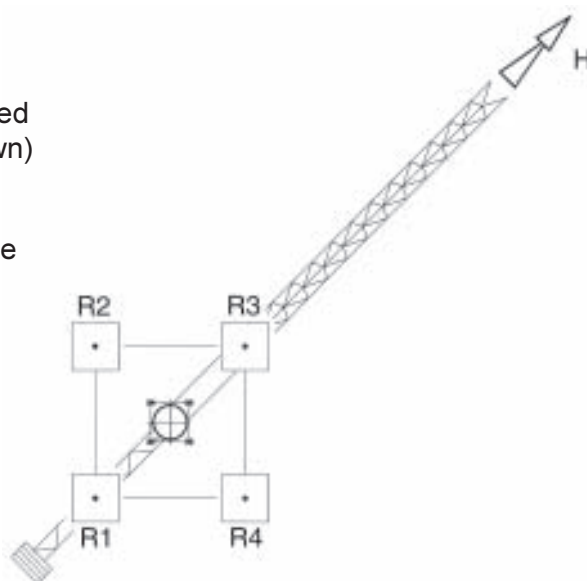
The twisting moment concerns in-service crane (for out-of-service crane, twisting moment is always 0) but does not consider the uprated dynamic safety factors (table 1.1).

CTT 181/A	
Twisting moment (M_t)	
[kNm]	[ft/lbs]
230	170000

Table 1.1

1.1 Installation “F₁”(stationary crane on 6 × 6 m / 20 × 20 ft undercarriage) Installation “T₁”(travelling crane on 6 × 6 m / 20 × 20 ft undercarriage)

V = Axial load
H = Horizontal thrust (force generated by the wind in the direction shown)
M = Overturning moment
R₁-R₂ -R₃-R₄ = Minimum/Maximum loads on base supports



CTT 181/A H20				F1-T1				Undercarriage 6×6 m						
	Hook height 66 m			No. 1 tower sec. H20 18.8 TA No. 1 tower sec. H20 18.10 B No. 12 tower sec. H20 18.4				Hook height 62,25 m			No. 1 tower sec. H20 18.8 TA No. 1 tower sec. H20 18.10 B No. 11 tower sec. H20 18.4			
	IN SERVICE CRANE (NO WIND)													
Jib	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
[m]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]
35-40-45	-257	-575	-894	-575	-2301	18	2704	-261	-568	-874	-568	-2271	18	2600
50-55	-256	-580	-905	-580	-2321	18	2752	-261	-573	-885	-573	-2291	18	2645
60-65	-283	-585	-888	-585	-2341	18	2564	-288	-578	-868	-578	-2311	18	2461
	IN SERVICE CRANE (TAIL WIND 72KM/H)													
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]
35-40-45	-47	-575	-1103	-575	-2301	59	4482	-75	-568	-1061	-568	-2271	57	4181
50-55	-46	-580	-1115	-580	-2321	59	4536	-74	-573	-1071	-573	-2291	57	4230
60-65	-72	-585	-1098	-585	-2341	59	4354	-100	-578	-1055	-578	-2311	57	4052
	OUT-OF-SERVICE CRANE (TAIL WIND 151KM/H)													
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]
35-40-45	120	-470	-1276	-470	-2095	177	5925	50	-476	-1166	-476	-2067	168	5157
50-55	120	-460	-1325	-460	-2125	177	6129	50	-468	-1211	-468	-2097	168	5350
60-65	120	-429	-1397	-429	-2135	177	6437	50	-438	-1281	-438	-2107	168	5648
	OUT-OF-SERVICE CRANE (WIND BLOWING FROM JIB POINT 135 KM/H)													
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]
35-40-45	-1596	-310	120	-310	-2095	-141	-7280	-1507	-305	50	-305	-2067	-135	-6606
50-55	-1564	-340	120	-340	-2125	-141	-7144	-1474	-336	50	-336	-2097	-135	-6465
60-65	-1496	-380	120	-380	-2135	-141	-6858	-1408	-375	50	-375	-2107	-135	-6185



CTT 181/A H20				F1-T1				Undercarriage 6×6 m						
	Hook height 58,50 m			No. 1 tower sec. H20 18.8 TA No. 1 tower sec. H20 18.10 B No. 10 tower sec. H20 18.4				Hook height 54,75 m			No. 1 tower sec. H20 18.8 TA No. 1 tower sec. H20 18.10 B No. 9 tower sec. H20 18.4			
IN SERVICE CRANE (NO WIND)														
Jib	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
[M]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]
35-40-45	-243	-538	-833	-538	-2151	18	2503	-202	-485	-768	-485	-1940	18	2401
50-55	-243	-543	-843	-543	-2171	18	2545	-202	-490	-778	-490	-1960	18	2442
60-65	-269	-548	-826	-548	-2191	18	2365	-228	-495	-762	-495	-1980	18	2265
	IN SERVICE CRANE (TAIL WIND 72KM/H)													
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]
35-40-45	-78	-538	-998	-538	-2151	55	3903	-56	-485	-913	-485	-1940	53	3636
50-55	-77	-543	-1008	-543	-2171	55	3949	-56	-490	-924	-490	-1960	53	3679
60-65	-103	-548	-992	-548	-2191	55	3773	-82	-495	-908	-495	-1980	53	3506
	OUT-OF-SERVICE CRANE (TAIL WIND151KM/H)													
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]
35-40-45	0	-452	-1048	-452	-1952	160	4448	0	-429	-894	-429	-1751	151	3792
50-55	0	-446	-1091	-446	-1982	160	4632	0	-423	-935	-423	-1781	151	3969
60-65	0	-416	-1160	-416	-1992	160	4921	0	-395	-1002	-395	-1791	151	4251
	OUT-OF-SERVICE CRANE (WIND BLOWING FROM JIB POINT 135 KM/H)													
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]
35-40-45	-1411	-271	0	-271	-1952	-128	-5986	-1276	-238	0	-238	-1751	-121	-5416
50-55	-1377	-303	0	-303	-1982	-128	-5842	-1242	-269	0	-269	-1781	-121	-5269
60-65	-1312	-340	0	-340	-1992	-128	-5566	-1178	-307	0	-307	-1791	-121	-4997

CTT 181/A H20				F1-T1				Undercarriage 6×6 m						
	Hook height 51 m			No. 1 tower sec. H20 18.8 TA No. 1 tower sec. H20 18.10 B No. 8 tower sec. H20 18.4				Hook height 47,25 m			No. 1 tower sec. H20 18.8 TA No. 1 tower sec. H20 18.10 B No. 7 tower sec. H20 18.4			
IN SERVICE CRANE (NO WIND)														
Jib	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
[M]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]
35-40-45	-183	-455	-726	-455	-1819	18	2305	-147	-402	-657	-402	-1608	18	2164
50-55	-184	-460	-736	-460	-1839	18	2344	-148	-407	-666	-407	-1628	18	2201
60-65	-209	-465	-721	-465	-1859	18	2170	-173	-412	-651	-412	-1648	18	2030
	IN SERVICE CRANE (TAIL WIND 72km/H)													
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]
35-40-45	-55	-455	-854	-455	-1819	51	3388	-36	-402	-768	-402	-1608	50	3107
50-55	-56	-460	-864	-460	-1839	51	3429	-36	-407	-778	-407	-1628	50	3146
60-65	-81	-465	-849	-465	-1859	51	3257	-61	-412	-763	-412	-1648	50	2976
	OUT-OF-SERVICE CRANE (TAIL WIND151km/H)													
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]
35-40-45	-34	-409	-785	-409	-1636	143	3186	-49	-359	-668	-359	-1435	135	2626
50-55	-21	-417	-812	-417	-1666	143	3356	-37	-366	-695	-366	-1465	135	2791
60-65	0	-410	-856	-410	-1676	143	3633	-8	-369	-730	-369	-1475	135	3062
	OUT-OF-SERVICE CRANE (WIND BLOWING FROM JIB POINT 135 km/H)													
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]
35-40-45	-1152	-242	0	-242	-1636	-114	-4891	-1039	-198	0	-198	-1435	-108	-4408
50-55	-1118	-275	0	-275	-1666	-114	-4743	-1004	-230	0	-230	-1465	-108	-4258
60-65	-1054	-311	0	-311	-1676	-114	-4474	-941	-267	0	-267	-1475	-108	-3993



CTT 181/A H20				F1-T1				Undercarriage6×6 m						
	Hook height 43,50 m			No. 1 tower sec. H20 18.8 TA No. 1 tower sec. H20 18.10 B No. 6 tower sec. H20 18.4				Hook height 39,75 m			No. 1 tower sec. H20 18.8 TA No. 1 tower sec. H20 18.10 B No. 5 tower sec. H20 18.4			
IN SERVICE CRANE (NO WIND)														
Jib	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
[M]	[κN]	[κN]	[κN]	[κN]	[κN]	[κN]	[κNm]	[κN]	[κN]	[κN]	[κN]	[κN]	[κN]	[κNm]
35-40-45	-127	-372	-617	-372	-1488	18	2077	-107	-342	-577	-342	-1367	18	1994
50-55	-128	-377	-626	-377	-1508	18	2113	-108	-347	-586	-347	-1387	18	2028
60-65	-153	-382	-611	-382	-1528	18	1944	-132	-352	-571	-352	-1407	18	1861
	IN SERVICE CRANE (TAIL WIND 72KM/H)													
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[κN]	[κN]	[κN]	[κN]	[κN]	[κN]	[κNm]	[κN]	[κN]	[κN]	[κN]	[κN]	[κN]	[κNm]
35-40-45	-31	-372	-713	-372	-1488	48	2892	-25	-342	-659	-342	-1367	46	2691
50-55	-32	-377	-722	-377	-1508	48	2929	-26	-347	-668	-347	-1387	46	2726
60-65	-57	-382	-707	-382	-1528	48	2761	-50	-352	-653	-352	-1407	46	2560
	OUT-OF-SERVICE CRANE (TAIL WIND151KM/H)													
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[κN]	[κN]	[κN]	[κN]	[κN]	[κN]	[κNm]	[κN]	[κN]	[κN]	[κN]	[κN]	[κN]	[κNm]
35-40-45	-82	-330	-579	-330	-1321	126	2108	-109	-301	-494	-301	-1206	118	1631
50-55	-70	-338	-605	-338	-1351	126	2270	-98	-309	-520	-309	-1236	118	1790
60-65	-41	-340	-639	-340	-1361	126	2537	-70	-311	-553	-311	-1246	118	2053
	OUT-OF-SERVICE CRANE (WIND BLOWING FROM JIB POINT 135 KM/H)													
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[κN]	[κN]	[κN]	[κN]	[κN]	[κN]	[κNm]	[κN]	[κN]	[κN]	[κN]	[κN]	[κN]	[κNm]
35-40-45	-934	-193	0	-193	-1320	-101	-3964	-839	-183	0	-183	-1206	-94	-3556
50-55	-899	-226	0	-226	-1350	-101	-3814	-802	-217	0	-217	-1236	-94	-3406
60-65	-837	-262	0	-262	-1360	-101	-3551	-741	-252	0	-252	-1246	-94	-3145

CTT 181/A H20				F1-T1				Undercarriage 6×6 m						
	Hook height 36 m			No. 1 tower sec. H20 18.8 TA No. 1 tower sec. H20 18.10 B No. 4 tower sec. H20 18.4				Hook height 32,25 m			No. 1 tower sec. H20 18.8 TA No. 1 tower sec. H20 18.10 B No. 3 tower sec. H20 18.4			
IN SERVICE CRANE (NO WIND)														
Jib	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
[M]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]
35-40-45	-86	-312	-537	-312	-1247	18	1914	-88	-304	-521	-304	-1217	18	1837
50-55	-87	-317	-546	-317	-1267	18	1947	-89	-309	-529	-309	-1237	18	1869
60-65	-112	-322	-532	-322	-1287	18	1782	-113	-314	-515	-314	-1257	18	1705
	IN SERVICE CRANE (TAIL WIND 72km/H)													
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]
35-40-45	-17	-312	-607	-312	-1247	44	2503	-30	-304	-578	-304	-1217	42	2327
50-55	-18	-317	-616	-317	-1267	44	2537	-31	-309	-587	-309	-1237	42	2360
60-65	-42	-322	-601	-322	-1287	44	2372	-55	-314	-573	-314	-1257	42	2196
	OUT-OF-SERVICE CRANE (TAIL WIND151km/H)													
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]
35-40-45	-132	-273	-413	-273	-1091	109	1193	-172	-266	-359	-266	-1063	101	791
50-55	-121	-280	-439	-280	-1121	109	1349	-162	-273	-385	-273	-1093	101	945
60-65	-93	-283	-472	-283	-1131	109	1609	-134	-276	-417	-276	-1103	101	1203
	OUT-OF-SERVICE CRANE (WIND BLOWING FROM JIB POINT 135 km/H)													
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]	[kN]	[kN]	[kN]	[kN]	[kN]	[kN]	[kNm]
35-40-45	-750	-171	0	-171	-1091	-87	-3183	-670	-197	0	-197	-1063	-81	-2844
50-55	-715	-203	0	-203	-1121	-87	-3033	-635	-229	0	-229	-1093	-81	-2693
60-65	-654	-239	0	-239	-1131	-87	-2775	-575	-264	0	-264	-1103	-81	-2437



CTT 181/A H20				F1-T1				Undercarriage 6×6 m						
	Hook height 28,50 m			No. 1 tower sec. H20 18.8 TA No. 1 tower sec. H20 18.10 B No. 2 tower sec. H20 18.4										
IN SERVICE CRANE (NO WIND)														
Jib	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
[M]	[κN]	[κN]	[κN]	[κN]	[κN]	[κN]	[κNm]	[κN]	[κN]	[κN]	[κN]	[κN]	[κN]	[κNm]
35-40-45	-89	-297	-504	-297	-1187	18	1762							
50-55	-90	-302	-513	-302	-1207	18	1794							
60-65	-114	-307	-499	-307	-1227	18	1631							
	IN SERVICE CRANE (TAIL WIND 72km/h)													
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[κN]	[κN]	[κN]	[κN]	[κN]	[κN]	[κNm]	[κN]	[κN]	[κN]	[κN]	[κN]	[κN]	[κNm]
35-40-45	-42	-297	-552	-297	-1187	40	2163							
50-55	-43	-302	-560	-302	-1207	40	2195							
60-65	-67	-307	-546	-307	-1227	40	2032							
	OUT-OF-SERVICE CRANE (TAIL WIND151km/h)													
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[κN]	[κN]	[κN]	[κN]	[κN]	[κN]	[κNm]	[κN]	[κN]	[κN]	[κN]	[κN]	[κN]	[κNm]
35-40-45	-209	-259	-309	-259	-1034	93	424							
50-55	-198	-266	-334	-266	-1064	93	577							
60-65	-170	-269	-367	-269	-1074	93	833							
	OUT-OF-SERVICE CRANE (WIND BLOWING FROM JIB POINT 135 km/h)													
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[κN]	[κN]	[κN]	[κN]	[κN]	[κN]	[κNm]	[κN]	[κN]	[κN]	[κN]	[κN]	[κN]	[κNm]
35-40-45	-597	-219	0	-219	-1034	-74	-2535							
50-55	-562	-251	0	-251	-1064	-74	-2385							
60-65	-520	-269	-18	-269	-1074	-74	-2130							



U.S. Customary Units

CTT 181/A H20				F1-T1				Undercarriage 20×20 ft						
	Hook height 217 ft			No. 1 tower sec. H20 18.8 TA No. 1 tower sec. H20 18.10 B No. 12 tower sec. H20 18.4				Hook height 204 ft			No. 1 tower sec. H20 18.8 TA No. 1 tower sec. H20 18.10 B No. 11 tower sec. H20 18.4			
	IN SERVICE CRANE (NO WIND)													
Jib	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
[FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]
115-131-148	-57670	-129309	-200947	-129309	-517235	4046	1994650	-58760	-127632	-196503	-127632	-510526	4046	1917619
164-180	-57530	-130433	-203335	-130433	-521731	4046	2029839	-58695	-128755	-198816	-128755	-515021	4046	1950721
197-213	-63627	-131557	-199486	-131557	-526226	4046	1891377	-64680	-129879	-195078	-129879	-519517	4046	1815349
	IN SERVICE CRANE (TAIL WIND 45 MPH)													
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]
115-131-148	-10592	-129312	-248032	-129312	-517247	13286	3305552	-16892	-127634	-238376	-127634	-510537	12857	3083414
164-180	-10284	-130436	-250587	-130436	-521742	13288	3345410	-16699	-128758	-240818	-128758	-515033	12857	3120100
197-213	-16214	-131559	-246905	-131559	-526238	13286	3211602	-22557	-129882	-237207	-129882	-519528	12857	2988276
	OUT-OF-SERVICE CRANE (TAIL WIND 94 MPH)													
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]
115-131-148	26972	-105607	-286827	-105607	-470978	39677	4369859	11239	-106931	-261972	-106931	-464588	37788	3803656
164-180	26972	-103472	-297736	-103472	-477721	39677	4520277	11239	-105246	-272137	-105246	-471331	37788	3945872
197-213	26972	-96391	-314094	-96391	-479969	39677	4747312	11239	-98390	-288011	-98390	-473578	37788	4165665
	OUT-OF-SERVICE CRANE (WIND BLOWING FROM JIB POINT 84 MPH)													
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]
115-131-148	-358698	-69642	26972	-69642	-470971	-31762	-5369680	-338793	-68494	11239	-68494	-464583	-30245	-4872461
164-180	-351592	-76497	26972	-76497	-477714	-31762	-5268841	-331349	-75575	11239	-75575	-471326	-30245	-4768458
197-213	-336284	-85376	26972	-85376	-479962	-31762	-5058526	-316388	-84228	11239	-84228	-473574	-30245	1-45615-43

CTT 181/A H20				F1-T1				Undercarriage 20×20 ft						
	Hook height 192 ft			No. 1 tower sec. H20 18.8 TA No. 1 tower sec. H20 18.10 B No. 10 tower sec. H20 18.4				Hook height 180 ft			No. 1 tower sec. H20 18.8 TA No. 1 tower sec. H20 18.10 B No. 9 tower sec. H20 18.4			
IN SERVICE CRANE (NO WIND)														
Jib	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
[FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]
115-131-148	-54569	-120861	-187152	-120861	-483442	4046	1845773	-45388	-108996	-172605	-108996	-435985	4046	1771066
164-180	-54568	-121984	-189401	-121984	-487938	4046	1877090	-45442	-110120	-174798	-110120	-440480	4046	1800841
197-213	-60456	-123108	-185761	-123108	-492433	4046	1744440	-51244	-111244	-171244	-111244	-444975	4046	1670588
IN SERVICE CRANE (TAIL WIND 45 MPH)														
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]
115-131-148	-17476	-120863	-224251	-120863	-483454	12428	2878645	-12676	-108999	-205322	-108999	-435996	11998	2681938
164-180	-17377	-121987	-226597	-121987	-487949	12428	2912683	-12657	-110123	-207589	-110123	-440491	11998	2713764
197-213	-23169	-123111	-223053	-123111	-492445	12428	2782718	-18387	-111247	-204107	-111247	-444987	11996	2585524
OUT-OF-SERVICE CRANE (TAIL WIND 94 MPH)														
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]
115-131-148	0	-101607	-235614	-101607	-438793	35900	3280608	0	-96376	-200879	-96376	-393597	34012	2797041
164-180	0	-100146	-245315	-100146	-445539	35900	3416142	0	-95140	-210159	-95140	-400341	34012	2927132
197-213	0	-93515	-260742	-93515	-447787	35900	3629769	0	-88734	-225172	-88734	-402588	34012	3135486
OUT-OF-SERVICE CRANE (WIND BLOWING FROM JIB POINT 84 MPH)														
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]
115-131-148	-317048	-60922	0	-60922	-438789	-28728	-4415263	-286817	-53444	0	-53444	-393593	-27211	-3994514
164-180	-309520	-68002	0	-68002	-445532	-28728	-4308921	-279228	-60524	0	-60524	-400336	-27211	-3886469
197-213	-294896	-76431	0	-76431	-447780	-28728	-4105134	-264706	-68953	0	-68953	-402584	-27211	-3685528

CTT 181/A H20								F1-T1								Undercarriage 20×20 ft							
Hook height 167 ft								No. 1 tower sec. H20 18.8 TA No. 1 tower sec. H20 18.10 B No. 8 tower sec. H20 18.4								Hook height 155 ft							
								IN SERVICE CRANE (NO WIND)															
Jib	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M		R1	R2	R3	R4	V	H	M	
[FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]		[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	
115-131-148	-41158	-102225	-163292	-102225	-408901	4046	1700304	-33035	-90361	-147687	-90361	-361443	4046	1596146		-33035	-90361	-147687	-90361	-361443	4046	1596146	
164-180	-41260	-103349	-165438	-103349	-413396	4046	1728760	-33178	-91485	-149791	-91485	-365939	4046	1623451		-33178	-91485	-149791	-91485	-365939	4046	1623451	
197-213	-46987	-104473	-161959	-104473	-417892	4046	1600608	-38838	-92609	-146379	-92609	-370434	4046	1497136		-38838	-92609	-146379	-92609	-370434	4046	1497136	
								IN SERVICE CRANE (TAIL WIND 45 MPH)															
R1	R2	R3	R4	V	H	M		R1	R2	R3	R4	V	H	M		R1	R2	R3	R4	V	H	M	
[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]		[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]		[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	
115-131-148	-12473	-102228	-191983	-102228	-408912	11567	2499075	-8050	-90363	-172676	-90363	-361452	11137	2291872		-8050	-90363	-172676	-90363	-361452	11137	2291872	
164-180	-12520	-103352	-194184	-103352	-413408	11567	2529049	-8153	-91487	-174822	-91487	-365950	11137	2320290		-8153	-91487	-174822	-91487	-365950	11137	2320290	
197-213	-18193	-104476	-190758	-104476	-417903	11567	2402388	-13775	-92611	-171448	-92611	-370445	11137	2195060		-13775	-92611	-171448	-92611	-370445	11137	2195060	
								OUT-OF-SERVICE CRANE (TAIL WIND 94 MPH)															
R1	R2	R3	R4	V	H	M		R1	R2	R3	R4	V	H	M		R1	R2	R3	R4	V	H	M	
[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]		[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]		[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	
115-131-148	-7555	-91951	-176347	-91951	-367803	32122	2349866	-11101	-80652	-150202	-80652	-322607	30234	1936515		-11101	-80652	-150202	-80652	-322607	30234	1936515	
164-180	-4726	-93637	-182547	-93637	-374546	32122	2475546	-8401	-82338	-156274	-82338	-329350	30234	2058633		-8401	-82338	-156274	-82338	-329350	30234	2058633	
197-213	0	-92176	-192454	-92176	-376796	32122	2679415	-1778	-82900	-164021	-82900	-331598	30234	2258689		-1778	-82900	-164021	-82900	-331598	30234	2258689	
								OUT-OF-SERVICE CRANE (WIND BLOWING FROM JIB POINT 84 MPH)															
R1	R2	R3	R4	V	H	M		R1	R2	R3	R4	V	H	M		R1	R2	R3	R4	V	H	M	
[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]		[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]		[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	
115-131-148	-259041	-54413	0	-54413	-367799	-25694	-3607214	-233595	-44463	0	-44463	-322603	-24176	-3250862		-233595	-44463	0	-44463	-322603	-24176	-3250862	
164-180	-251183	-61718	0	-61718	-374542	-25694	-3497952	-225707	-51768	0	-51768	-329346	-24176	-3140766		-225707	-51768	0	-51768	-329346	-24176	-3140766	
197-213	-236979	-69922	0	-69922	-376790	-25694	-3299607	-211587	-59972	0	-59972	-331594	-24176	-2944753		-211587	-59972	0	-59972	-331594	-24176	-2944753	



CTT 181/A H20				F1-T1				Undercarriage 20×20 ft						
	Hook height 143 ft			No. 1 tower sec. H20 18.8 TA No. 1 tower sec. H20 18.10 B No. 6 tower sec. H20 18.4				Hook height 130 ft			No. 1 tower sec. H20 18.8 TA No. 1 tower sec. H20 18.10 B No. 5 tower sec. H20 18.4			
IN SERVICE CRANE (NO WIND)														
Jib	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
[FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]
115-131-148	-28570	-83590	-138610	-83590	-334360	4046	1531934	-24007	-76819	-129631	-76819	-307276	4046	1470466
164-180	-28748	-84714	-140679	-84714	-338855	4046	1558258	-24216	-77943	-131670	-77943	-311771	4046	1495934
197-213	-34352	-85838	-137324	-85838	-343350	4046	1433536	-29769	-79067	-128364	-79067	-316267	4046	1372599
IN SERVICE CRANE (TAIL WIND 45 MPH)														
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]
115-131-148	-6986	-83592	-160199	-83592	-334369	10708	2132972	-5545	-76821	-148098	-76821	-307285	10277	1984567
164-180	-7136	-84716	-162296	-84716	-338864	10708	2160092	-5734	-77945	-150156	-77945	-311780	10277	2010596
197-213	-12712	-85840	-158969	-85840	-343362	10708	2036145	-11269	-79070	-146870	-79070	-316278	10277	1887792
OUT-OF-SERVICE CRANE (TAIL WIND 94 MPH)														
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]
115-131-148	-18361	-74203	-130046	-74203	-296813	28346	1554835	-24548	-67755	-110962	-67755	-271021	26458	1203019
164-180	-15763	-75889	-136015	-75889	-303556	28346	1674092	-22032	-69441	-116850	-69441	-277764	26458	1320011
197-213	-9256	-76451	-143646	-76451	-305804	28346	1870932	-15623	-70003	-124383	-70003	-280012	26458	1514122
OUT-OF-SERVICE CRANE (WIND BLOWING FROM JIB POINT 84 MPH)														
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]
115-131-148	-209988	-43409	0	-43409	-296809	-22659	-2923334	-188478	-41231	0	-41231	-271017	-21142	-2622867
164-180	-202081	-50714	0	-50714	-303552	-22659	-2812700	-180335	-48761	0	-48761	-277760	-21142	-2511908
197-213	-188036	-58918	0	-58918	-305799	-22659	-2618773	-166581	-56740	0	-56740	-280007	-21142	-2319825

CTT 181/A H20								F1-T1								Undercarriage 20×20 ft							
Hook height 118 ft								No. 1 tower sec. H20 18.8 TA No. 1 tower sec. H20 18.10 B No. 4 tower sec. H20 18.4								Hook height 106 ft							
								IN SERVICE CRANE (NO WIND)															
Jib	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M		R1	R2	R3	R4	V	H	M	
[FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]		[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	
115-131-148	-19356	-70048	-120740	-70048	-280192	4046	1411432	-19720	-68371	-117022	-68371	-273483	4046	1354595		-19720	-68371	-117022	-68371	-273483	4046	1354595	
164-180	-19591	-71172	-122753	-71172	-284688	4046	1436184	-19977	-69495	-119012	-69495	-277978	4046	1378728		-19977	-69495	-119012	-69495	-277978	4046	1378728	
197-213	-25102	-72296	-119489	-72296	-289183	4046	1314022	-25452	-70618	-115785	-70618	-282474	4046	1257569		-25452	-70618	-115785	-70618	-282474	4046	1257569	
								IN SERVICE CRANE (TAIL WIND 45 MPH)															
R1	R2	R3	R4	V	H	M		R1	R2	R3	R4	V	H	M		R1	R2	R3	R4	V	H	M	
[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]		[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]		[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	
115-131-148	-3755	-70050	-136345	-70050	-280201	9847	1845869	-6734	-68373	-130012	-68373	-273492	9418	1716221		-6734	-68373	-130012	-68373	-273492	9418	1716221	
164-180	-3977	-71174	-138372	-71174	-284697	9847	1870998	-6982	-69497	-132011	-69497	-277987	9418	1740605		-6982	-69497	-132011	-69497	-277987	9418	1740605	
197-213	-9475	-72298	-135121	-72298	-289192	9847	1749205	-12449	-70621	-128792	-70621	-282483	9418	1619682		-12449	-70621	-128792	-70621	-282483	9418	1619682	
								OUT-OF-SERVICE CRANE (TAIL WIND 94 MPH)															
R1	R2	R3	R4	V	H	M		R1	R2	R3	R4	V	H	M		R1	R2	R3	R4	V	H	M	
[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]		[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]		[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	
115-131-148	-29717	-61307	-92896	-61307	-245227	24570	879555	-38765	-59710	-80655	-59710	-238839	22682	583174		-38765	-59710	-80655	-59710	-238839	22682	583174	
164-180	-27265	-62992	-98720	-62992	-251970	24570	994769	-36362	-61395	-86429	-61395	-245582	22682	697009		-36362	-61395	-86429	-61395	-245582	22682	697009	
197-213	-20937	-63554	-106172	-63554	-254218	24570	1186609	-30102	-61957	-93813	-61957	-247830	22682	886968		-30102	-61957	-93813	-61957	-247830	22682	886968	
								OUT-OF-SERVICE CRANE (WIND BLOWING FROM JIB POINT 84 MPH)															
R1	R2	R3	R4	V	H	M		R1	R2	R3	R4	V	H	M		R1	R2	R3	R4	V	H	M	
[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]		[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]		[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	
115-131-148	-168559	-38379	0	-38379	-245222	-19625	-2347941	-150543	-44199	0	-44199	-238834	-18108	-2097303		-150543	-44199	0	-44199	-238834	-18108	-2097303	
164-180	-160635	-45684	0	-45684	-251965	-19625	-2236828	-142617	-51504	0	-51504	-245577	-18108	-1986138		-142617	-51504	0	-51504	-245577	-18108	-1986138	
197-213	-146939	-53663	0	-53663	-254213	-19625	-2046368	-129197	-59259	0	-59259	-247825	-18108	-1797087		-129197	-59259	0	-59259	-247825	-18108	-1797087	



CTT 181/A H20				F1-T1				Undercarriage 20×20 ft						
	Hook height 94 ft			No. 1 tower sec. H20 18.8 TA No. 1 tower sec. H20 18.10 B No. 2 tower sec. H20 18.4										
IN SERVICE CRANE (NO WIND)														
Jib	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
[FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]
115-131-148	-20013	-66693	-113374	-66693	-266774	4046	1299728							
164-180	-20289	-67817	-115345	-67817	-271269	4046	1323338							
197-213	-25734	-68941	-112148	-68941	-275764	4046	1203027							
IN SERVICE CRANE (TAIL WIND 45 MPH)														
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]
115-131-148	-9408	-66696	-123983	-66696	-266783	8986	1595062							
164-180	-9679	-67820	-125960	-67820	-271278	8986	1618826							
197-213	-15119	-68943	-122768	-68943	-275773	8986	1498648							
OUT-OF-SERVICE CRANE (TAIL WIND 94 MPH)														
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]
115-131-148	-46877	-58112	-69348	-58112	-232449	20794	312836							
164-180	-44511	-59798	-75085	-59798	-239192	20794	425631							
197-213	-38306	-60360	-82413	-60360	-241439	20794	614041							
OUT-OF-SERVICE CRANE (WIND BLOWING FROM JIB POINT 84 MPH)														
	R1	R2	R3	R4	V	H	M	R1	R2	R3	R4	V	H	M
	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS]	[LBS.FT]
115-131-148	-134259	-49120	0	-49120	-232444	-16590	-1869884							
164-180	-126334	-56425	0	-56425	-239187	-16590	-1758749							
197-213	-116778	-60359	-4046	-60359	-241435	-16590	-1570900							

2 BASE BALLAST

2.1 PREPARATION

The ballast blocks shall be prepared with maximum precision.

They shall be installed once they have been cured and the exact weight has been established.



The weight of the base ballasts shall be within a tolerance of $\pm 3\%$

The base ballast satisfies stability according to F.E.M./DIN standards.

2.2 TYPE AND QUANTITY

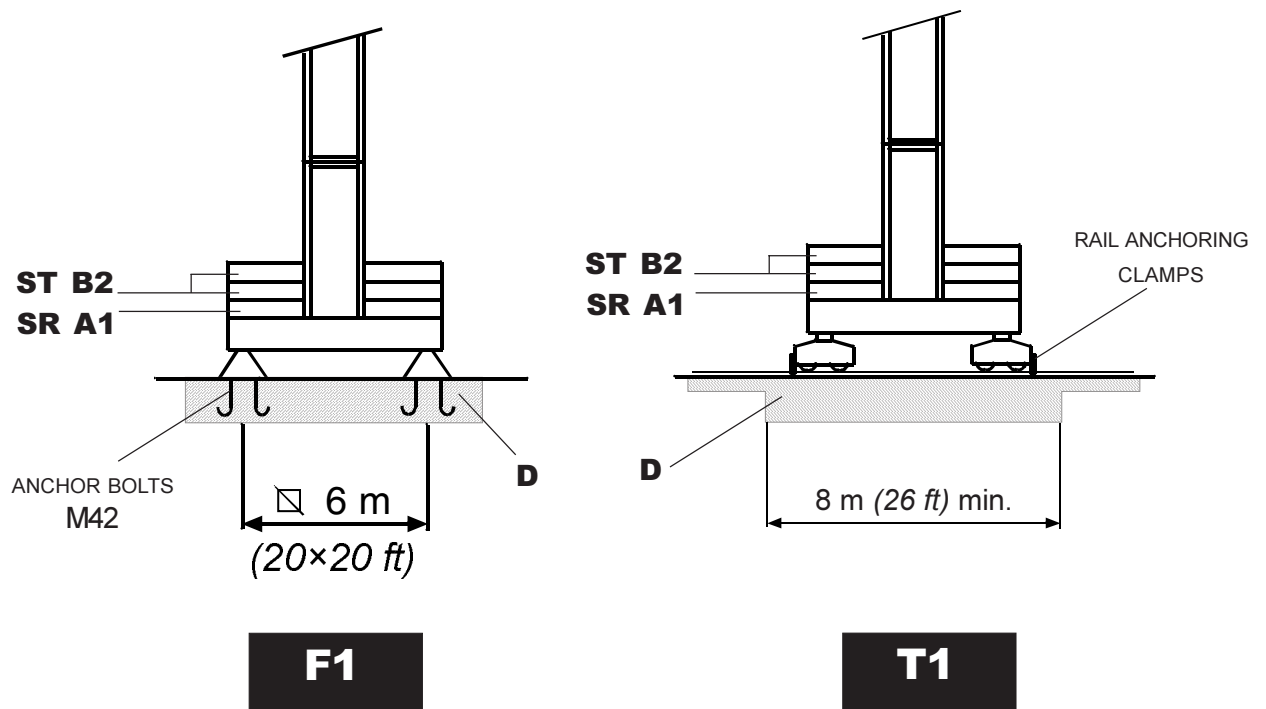
Position on the undercarriage (installations "F" and "T") the exact quantity and type of ballast required by the tower height of the crane.

CTT 181/A H20		BASE BALLAST	
BLOCK TYPE		WEIGHT OF BLOCK	
		kg	lbs
SR "A1"	Code 390105007	7250	15,986
ST "B2"	Code 390106005	4400	9,702
D	Additional subundercarriage ballast (concrete bed min. weight - if stationary crane, or of out-of-service parking area - if travelling crane)		

Table 2.2.1

2.2.1 Installation “F₁” - “T₁”

Stationary crane on undercarriage (6×6 m / 20×20 ft)
Travelling crane on undercarriage (6×6 m / 20×20 ft)



CTT 181/A H20	Base ballast			
F1-T1				
Tower height	Block type			Total ballast
	SR "A1" (7,25 t)	ST "B2" (4,4 t)	D	
[m]	[no.]	[no.]	[t]	[t]
66	2	24	50	170,1
62,25	2	24	20	140,1
58,50	2	22	0	111,3
54,75	2	18	0	93,7
51	2	16	0	84,9
47,25	2	12	0	67,3
43,50	2	10	0	58,5
39,75	2	8	0	49,7
36	2	6	0	40,9
32,25	2	6	0	40,9
28,50	2	6	0	40,9

Table 2.2.2



U.S. Customary Units

CTT 181/A H20				
F1-T1				
Base ballast				
Tower height	Block type			Total ballast
	SR "A1" (15,986 lbs)	ST "B2" (9,702 lbs)	D	
[ft]	[no.]	[no.]	[lbs]	[lbs]
217	2	24	110250	375070
204	2	24	44100	308920
192	2	22	0	245416
180	2	18	0	206608
167	2	16	0	187204
155	2	12	0	148396
143	2	10	0	128992
130	2	8	0	109588
118	2	6	0	90184
106	2	6	0	90184
94	2	6	0	90184

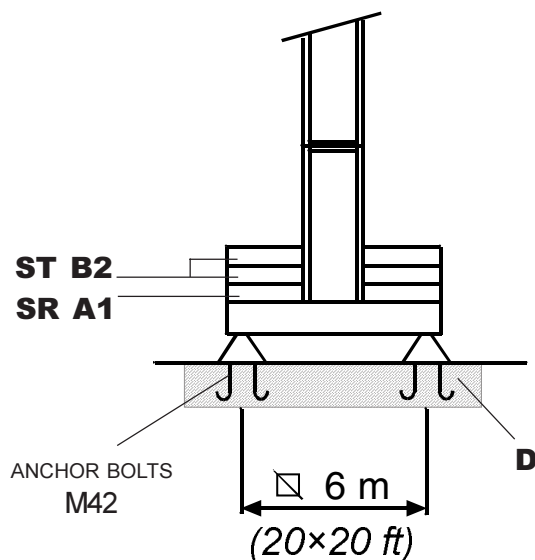
2.2.2 Additional subundercarriage ballast



For the stability of the crane, both installation “**T₁**” and “**F₁**” for tower heights with “**D**” value >0 (see table 2.2.2) need an additional ballasting “**D**” under the undercarriage.

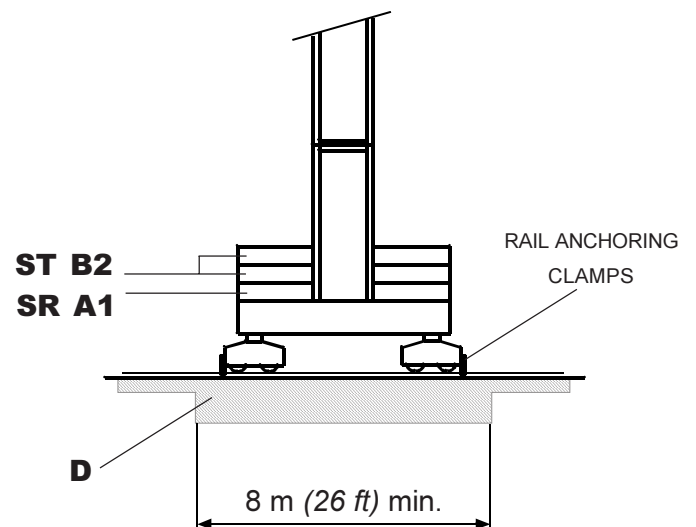
For installation “**T₁**” (picture 2.2.1) make heavier the concrete kerbs connected to the rail tacks in the proper area used for parking the crane in out-of-service condition (out-of-service parking area with min. side 8 m / 26 ft approx.), securing the clamps of the bogies to the rail tracks themselves in that area.

For installation “**F₁**” (picture 2.2.2) arrange 4 concrete beds (one for each base support) or just one concrete bed with min. side 8 m (26 ft) to which two M42 anchor bolts for each plate shall be diagonally tied (para. 3.2) .



Picture 2.2.1

F1



Picture 2.2.2

T1

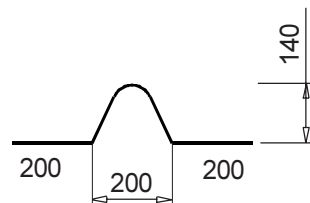
SR “A1”



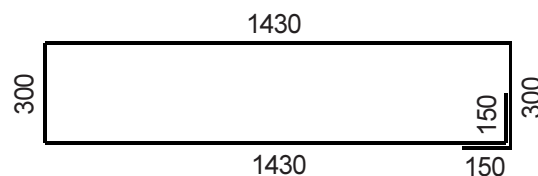
Reinforcing rods for base ballast **SR "A1"****SR "A1"**

Round bar Ø 20	Length		Quantity
	[mm]	[inches]	
Pos. 1	5650	222	16
Pos. 2	5200	205	4
Pos. 3	5450	215	4

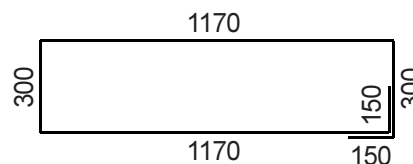
- ④ Round bar Ø 16 L=750 No. 16 pcs.



- ③ Round bar Ø 12 L=3760 No. 20 pcs.



- ⑦ Round bar Ø 12 L=3240 No. 2 pcs.



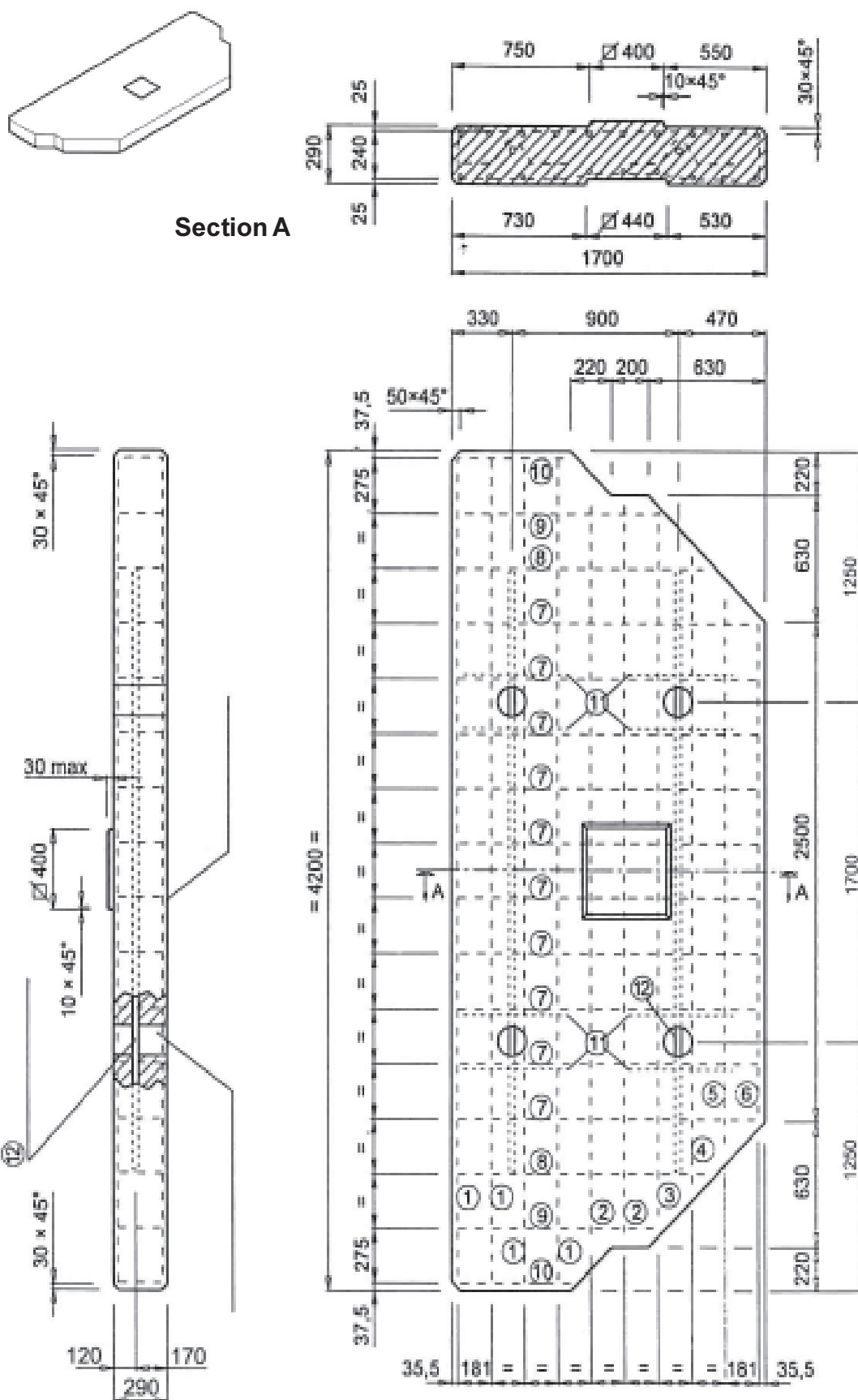
Concrete: anti-freeze B 255 (INORM B 4200 standard) or anti-freeze B 25 (Din 1045 standard)

Steel: STS 50/620

SEASONING: FOUR WEEKS

2.3.2 Base ballast block **ST "B2"** (4400 kg / 9,700 lbs) -
Code 390106005

ST "B2"

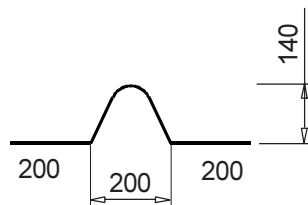


Dimensions are expressed in millimetres [1 mm = 0.03937 in.]

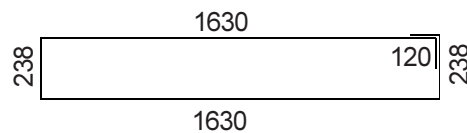
Reinforcing rods for base ballast **ST "B2"****ST "B2"**

Round bar Ø 20	Length		Quantity
	[mm]	[inches]	
Pos. 1	4095	161	10
Pos. 2	3700	146	2
Pos. 3	3400	134	2
Pos. 4	3000	118	2
Pos. 5	2700	106	2
Pos. 6	2400	94	2

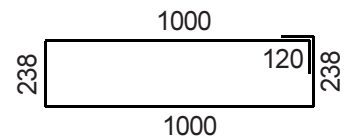
⑪ Round bar Ø 16 L=750 No. 8 pcs.



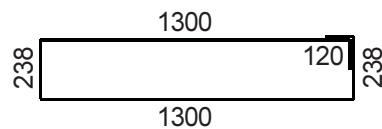
⑦ Round bar Ø 10 L=2980 No. 10 pcs.



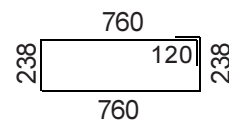
⑨ Round bar Ø 10 L=2720 No. 2 pcs.



⑧ Round bar Ø 10 L=3320 No. 2 pcs.



⑩ Round bar Ø 10 L=2250 No. 2 pcs.

**Concrete: anti-freeze B 255 (INORM B 4200 standard) or anti-freeze B 25 (Din 1045 standard)****Steel: STS 50/620****SEASONING: FOUR WEEKS**

3

BASE SUPPORTS



Comedil just provides some general requirements concerning the dimensions of the supports. The actual dimensions shall be calculated by the designer engineer according to the geological characteristics of the ground and to the stresses at the crane base.

3.1 INSTALLATION “T”



For travelling cranes on rails “T” the user shall install travel tracks according to CNR 10021/85 standards. The main provisions are given below:

- A) the travel tracks shall be perfectly leveled both longitudinally and transversally;
- B) the gauge shall be constant and the rail tracks perfectly straight and with the same shape along the entire path;
- C) the rail tracks shall be placed on a solid base;
- D) travelling stop buffers shall be placed at the ends of the rail tracks (picture 3.1.3).

RAIL SHAPE TOLERANCES [mm]		
Straightness on the horizontal plane of a rail		$L = 2000$ $r = \pm 1$
Straightness on the vertical plane of a rail		$V/L \leq 0,002$
Parallelism of the rails		$P-i \leq 3$
Difference in level		$h/i \leq 0,002$
Eccentricity of the rail about the beam		$\Sigma \leq 0.5 S$ for $S < 12$ mm $\Sigma \leq 6$ mm for $S \geq 12$ mm
Inclination of the rail about the horizontal plane		$\beta^\circ \pm 0.003$ radius.

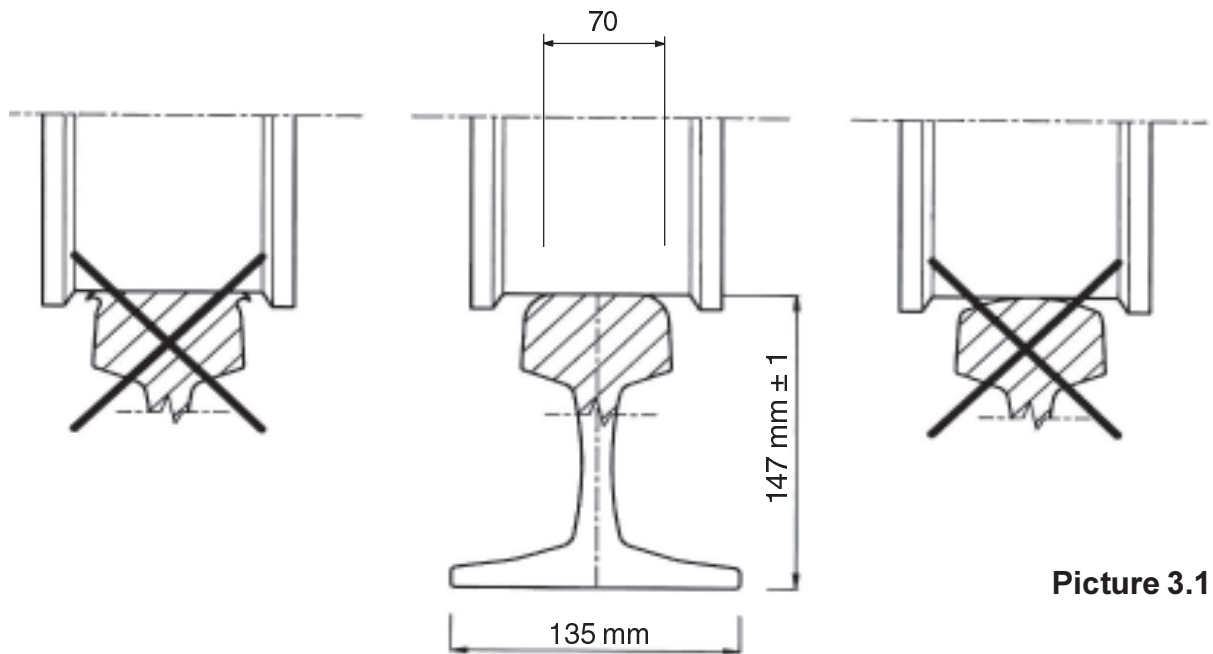
Dimensions are expressed in millimeters [1 mm = 0.03937 in.]

Table 3.1.1

The rail shall be 50 UNI 3141 type and have a nominal head of 70 mm (0,23 ft) and weight per metre of 50 kg (110 lbs).

Slightly used rails are preferable as they provide a better bearing surface (picture 3.1.1).

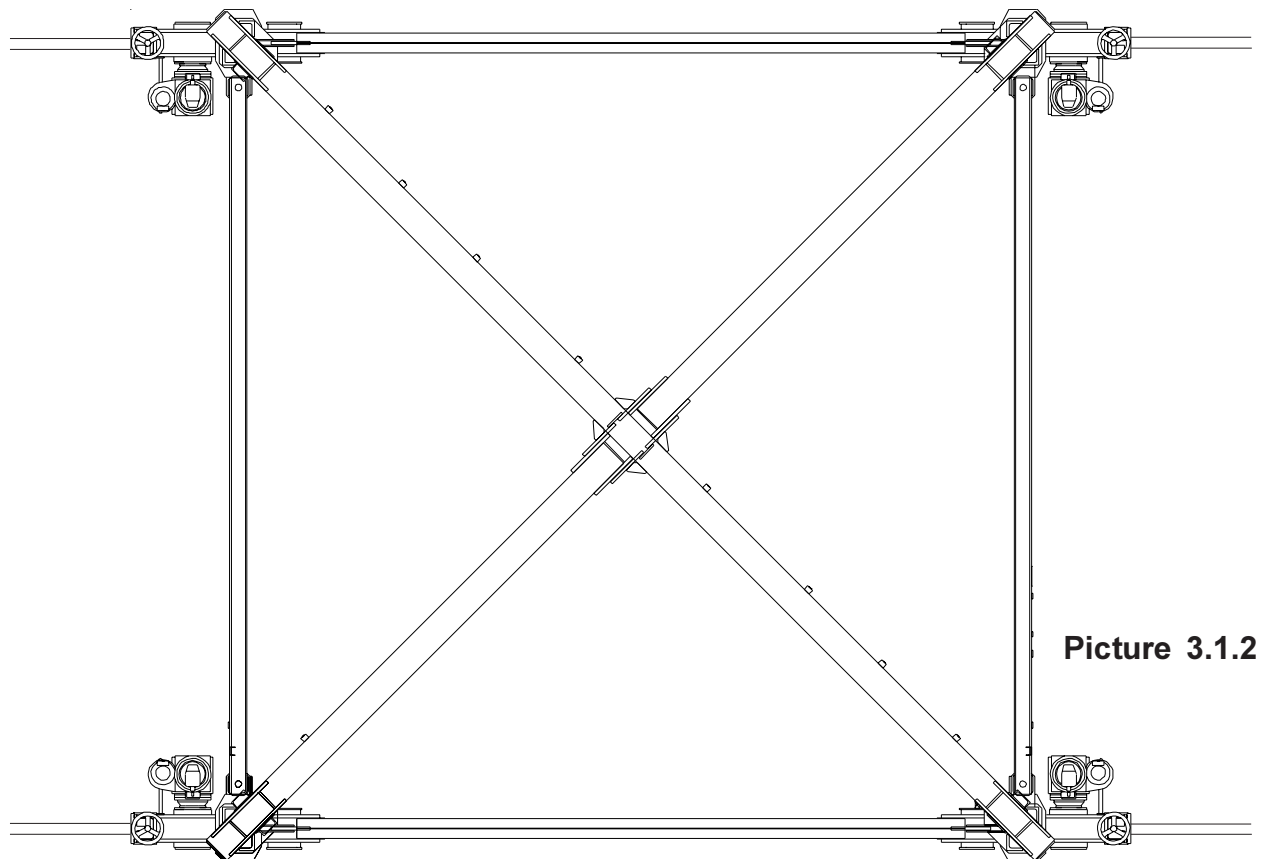
Dimensions are approximate. In fact, the rails shall be chosen according to the travelling equipment used and to the crane own configuration.



Picture 3.1.1

Dimensions are expressed in millimeters [1 mm = 0.03937 in.]

Position the base supports as shown in picture 3.1.2.



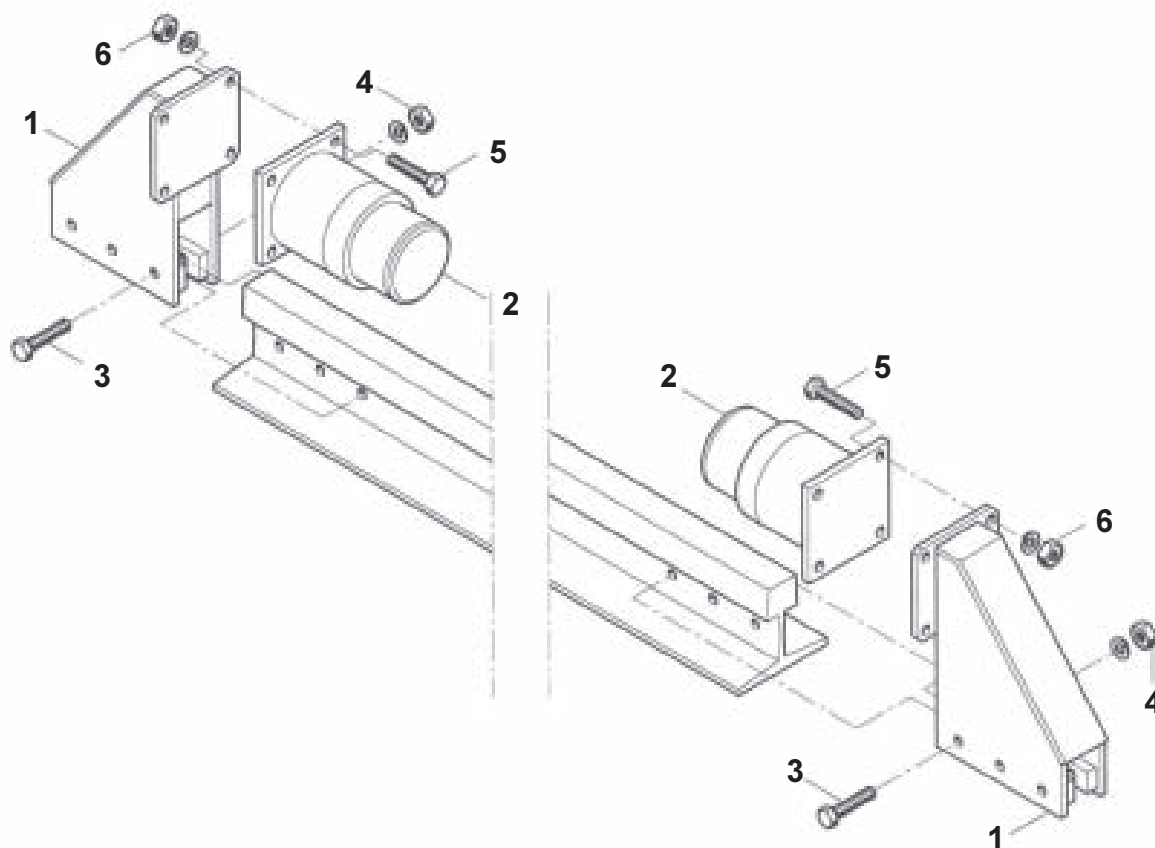
Picture 3.1.2

3.1.1 Assembling the rail buffers

Make the fixing holes on rail buffer support (1) match those on the rail track.

Place screws (3) and secure them with nuts (4).

Connect rail buffer (2) to rail buffer support (1) with screws (5) and nuts (6) (picture 3.1.3).



Picture 3.1.3

IMPORTANT NOTICE



For tower heights where value “D” is >0 (see table 2.2.2) follow the indications given at para. 2.2.2.

3.2 APPOGGIO "F"

Stationary crane on undercarriage ("F" installation) requires four concrete beds (one for each base plate).

For tower heights with the "D" value = 0 (see table 2.2.2) the crane can simply rest on them. With tower heights with the "D" value > 0 (see table 2.2.2) instead, the crane shall be anchored to the four concrete beds by two M42 anchor bolts for each base plate positioned one diagonal to the other (picture 3.2.1).

The concrete bed "L" side could be calculated with the formula:

$$L = \sqrt{\frac{R}{\sigma t}}$$

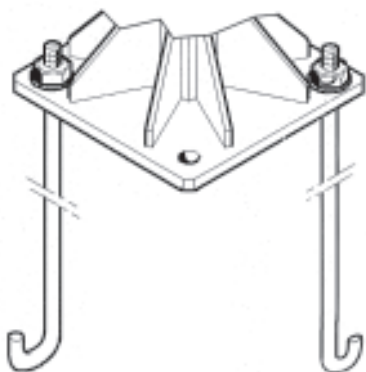
where "R" represents the highest value indicated at para. 1.1 and " σt " the ground resistance.

The dimensions of the concrete foundations shall be calculated anyhow by the designer engineer responsible for the concrete works, who shall refer to the load values indicated in the tables (para. 1.1) and to the ground resistance values measured.

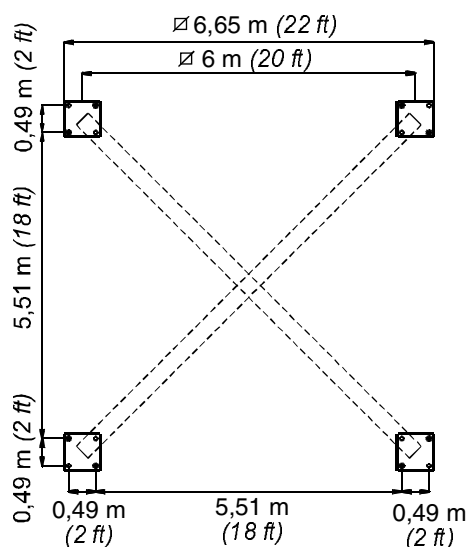
At the customer's convenience, the four concrete beds can be replaced by a single concrete bed.

3.2.1 Placing the anchor bolts

Place 2 M42 Comedil anchor bolts for each base plate positioned one diagonal to the other (pictures 3.2.1 and 3.2.2).



Picture 3.2.1



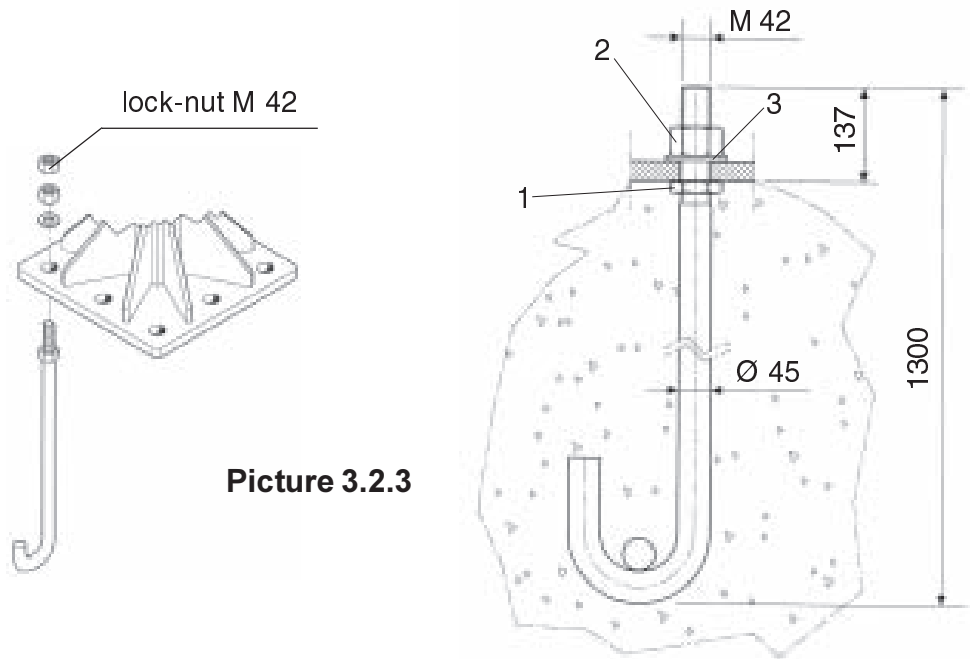
Picture 3.2.2

The minimum weight of the concrete beds shall conform to the values indicated in table 2.2.2.

For the positioning of the anchor bolts proceed as follows:

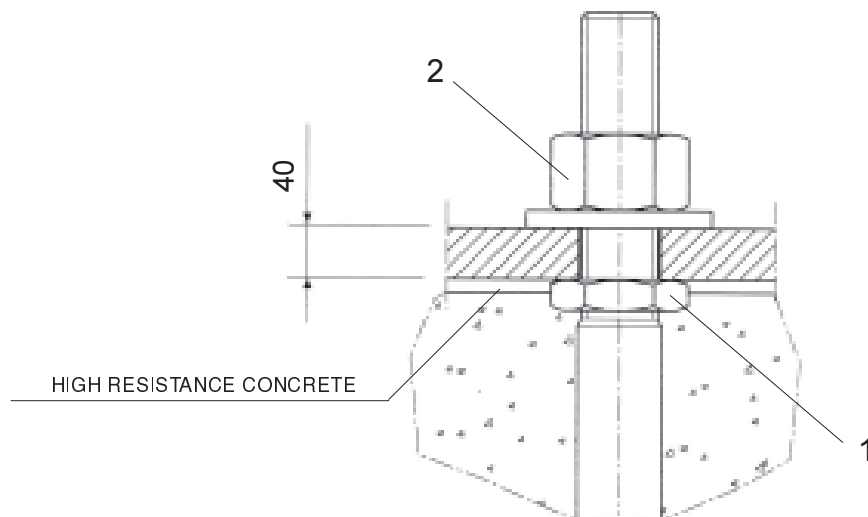
- Screw down flat nut M42 **(1)** on the anchor bolt until there is 137 mm (5 in) clearance between the base plate bottom and the anchor bolt head.
- Place the anchor bolt in the hole of the plate.
- Position washer **(3)** and screw tall nut M42 **(2)**.
- Now the anchor bolts stay at right angle about the surface of the base plate (picture 3.2.3).

Dimensions are expressed in millimetres [1 mm = 0.03937 in.]



Picture 3.2.3

- Weld or connect the anchor bolts to the reinforcement mesh cage.
- Remove the shims used for leveling.
- Check the base plates for proper level.
- The undercarriage should be installed level to a tolerance of 1 : 500 (about 1 in. in 40 ft). In case of deviation from the above value, contact Comedil Engineering Department.
- Secure nuts **(2)** (picture 3.2.4) with lock-nuts M42, thus preventing them from loosening.
- To correct any leveling error, rotate nuts **(1)** and **(2)** (picture 3.2.4).
- Pour the concrete.
- Inspect the concrete three days after pouring and, if necessary, use high-resistance concrete for the final leveling of the base plates (picture 3.2.4).



Picture 3.2.4



3.2.2 Final leveling

To correct any leveling error, remove the lock nuts and tall nuts M42. Then place shims where necessary.

Screw tall nuts M42 down to the plate without tightening them firmly.

Fill the empty spaces between the concrete slab and the base plates with high-resistance concrete.

On completing the crane erection, screw the tall nuts firmly and secure them with lock nuts.



Torque wrench setting for anchor bolts is 1450 Nm (1,069 lbs_ft).

NOTICE



Be sure that, once completed the crane erection and during the crane whole working period, the part of the anchor bolts jutting out of the concrete foundation is always clean from deposits, earth or mud and that it does not stay into the water for a long time.