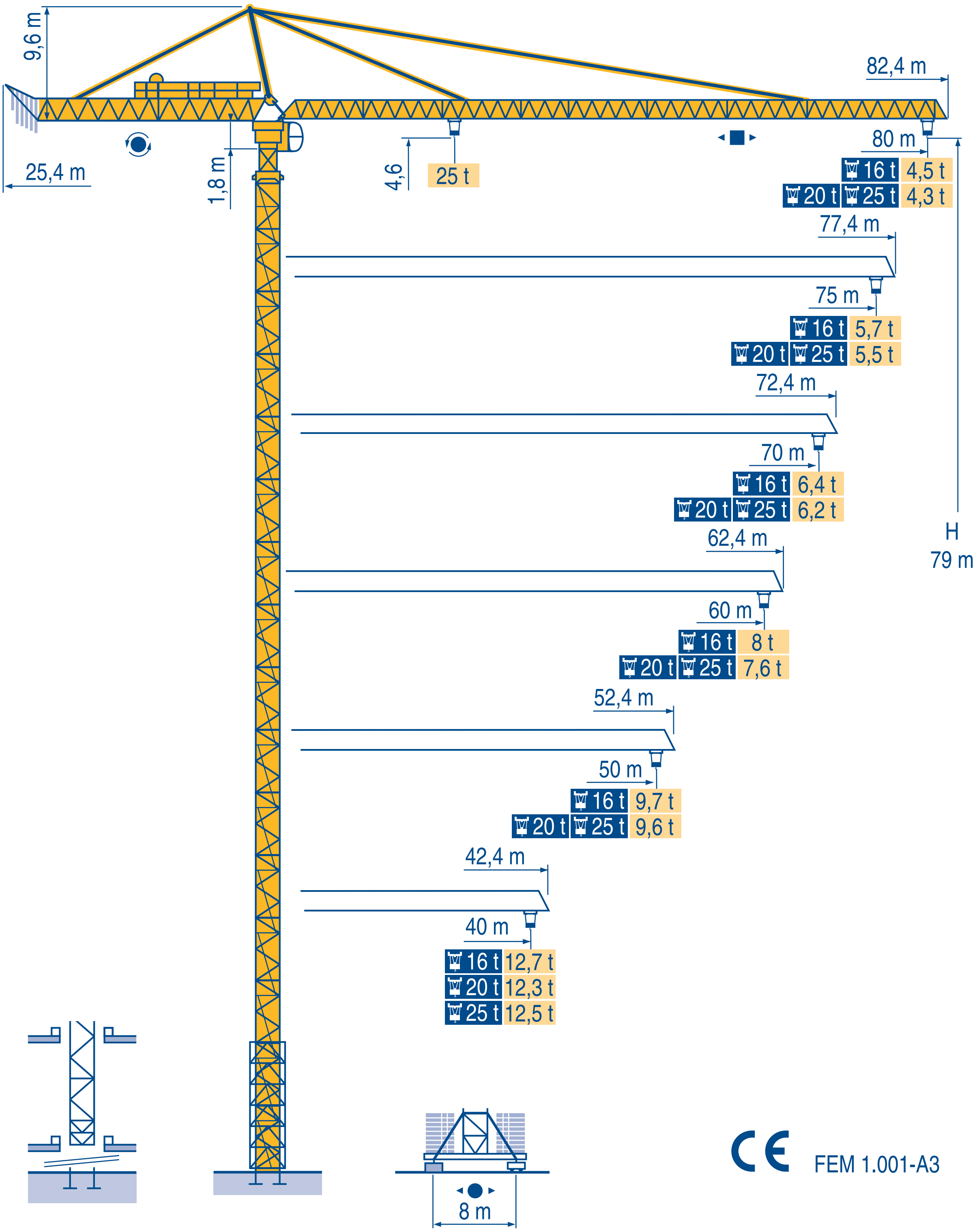
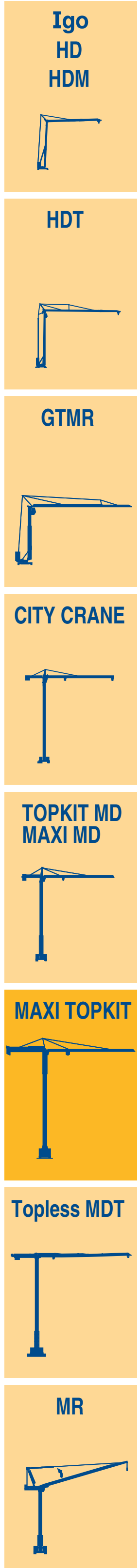
MD 550



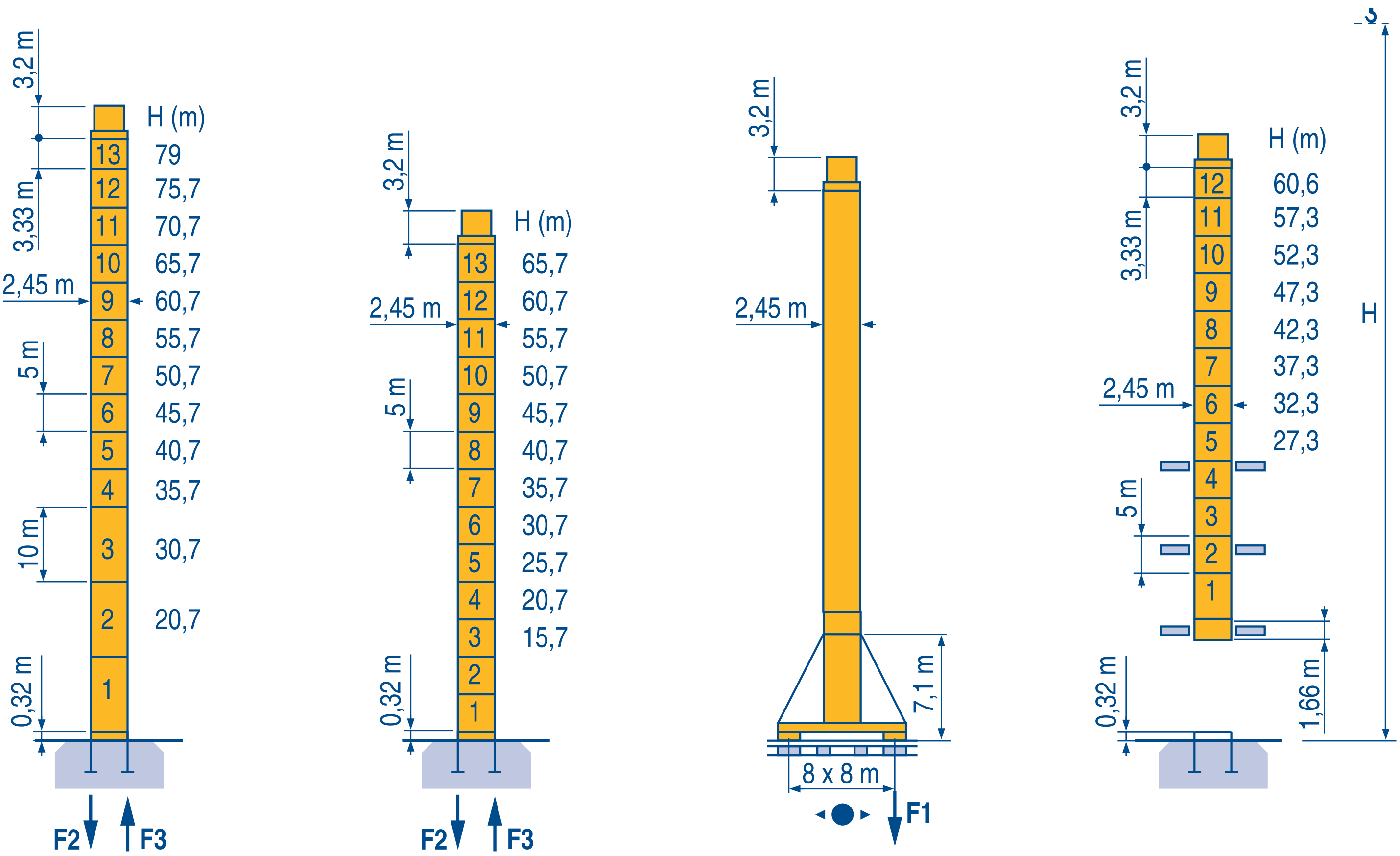
LWB 2



POTAIN ISO 9001 POTAIN

POTAIN

⧄ 2,45 m x 2,45 m



P 850 A		
F2	● 286 t	■ 357 t
F3	● 178 t	■ 233 t
⩓	171 t	

LWB 2

P 800 A		
F2	● 246 t	■ 248 t
F3	● 140 t	■ 130 t
⩓	157 t	

ⓘ

B 800 B

👁

	F	D	GB	E	I	P
👁	Voir télescopage sur dalles	Siehe Kletterkrane im Gebäude	See climbing crane	Vea grua trepadora	Consultare gru in cavedio	Ver telescopagem sobre lages
●	Réactions en service	Reaktionskräfte in Betrieb	Reactions in service	Reacciones en servicio	Reazioni in servizio	Reacções em serviço
■	Réactions hors service	Reaktionskräfte außer Betrieb	Reactions out of service	Reacciones fuera de servicio	Reazioni fuori servizio	Reacções fora de serviço
⩓	A vide sans lest (ni train de transport) avec flèche et hauteur maximum.	Ohne Last, Ballast (und Transportachse), mit Maximalausleger und Maximalhöhe.	Without load, ballast (or transport axles), with maximum jib and maximum height.	Sin carga, sin lastre, (ni tren de transporte), flecha y altura máxima.	A vuoto, senza zavorra (ne assali di trasporto) con braccio massimo e altezza massima.	Sem carga (nem trem de transporte)- sem lastro com lança e altura máximas.
ⓘ	Nous consulter	Auf Anfrage	Consult us	Consultarnos	Consultateci	Consultar-nos

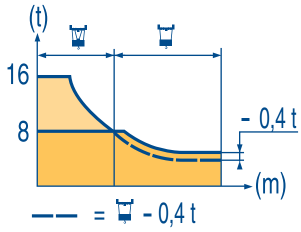
16 t

80 m	4 ►	29,4	30	32	35	37	40	42	45	47	50	51,2	53,1	55	57	60	65	70	75	80	m
		16	15,6	14,5	13	12,1	11	10,4	9,5	9	8,3	8	8	7,6	7,3	6,8	6,1	5,5	5	4,5	t

75 m	4 ►	32,1	35	37	40	42	45	47	50	52	55	56,2	58,3	60	65	70	75	m
		16	14,5	13,5	12,3	11,6	10,7	10,1	9,3	8,9	8,2	8	8	7,7	6,9	6,3	5,7	t

70 m	4 ►	32,4	35	37	40	42	45	47	50	52	55	57	59	60	65	70	m
		16	14,6	13,7	12,5	11,8	10,8	10,2	9,5	9	8,4	8	8	7,8	7,1	6,4	t

60 m	4 ►	32,9	35	37	40	42	45	47	50	52	55	57	60	60	m
		16	14,9	14	12,7	12	11,1	10,5	9,7	9,3	8,6	8,2	7,7	8	t



50 m	4 ►	32,9	35	37	40	42	45	47	50	m
		16	14,9	14	12,7	12	11,1	10,5	9,7	t

40 m	4 ►	32,9	35	37	40	m
		16	14,9	14	12,7	t

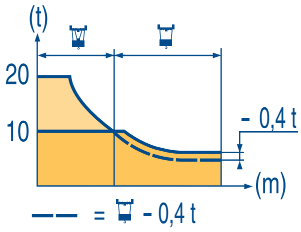
20 t

80 m	4 ►	24,1	25	27	30	32	35	37	40	42,6	43,9	45	47	50	55	60	65	70	75	80	m
		20	19,1	17,5	15,5	14,3	12,8	12	10,8	10	10	9,7	9,2	8,4	7,4	6,6	5,9	5,3	4,8	4,3	t

75 m	4 ►	26,3	27	30	32	35	37	40	42	45	46,6	48	50	55	60	65	70	75	m
		20	19,4	17,1	15,9	14,3	13,4	12,1	11,4	10,5	10	10	9,5	8,4	7,5	6,7	6,1	5,5	t

70 m	4 ►	26,5	27	30	32	35	37	40	42	45	47,1	48,6	50	55	60	65	70	m
		20	19,5	17,3	16,1	14,4	13,5	12,3	11,6	10,6	10	10	9,6	8,6	7,6	6,9	6,2	t

60 m	4 ►	26,5	27	30	32	35	37	40	42	45	47,1	48,6	50	55	60	m
		20	19,5	17,3	16,1	14,4	13,5	12,3	11,6	10,6	10	10	9,6	8,6	7,6	t



50 m	4 ►	26,5	27	30	32	35	37	40	42	45	47,1	48,6	50	m
		20	19,5	17,3	16,1	14,4	13,5	12,3	11,6	10,6	10	10	9,6	t

40 m	4 ►	26,5	27	30	32	35	37	40	m
		20	19,5	17,3	16,1	14,4	13,5	12,3	t

LWB 2

Courbes de charges / Lastkurven / Load diagrams / Curvas de cargas / Curve di carico / Curva de cargas

25 t

80 m	4	►	19,8	22	25	27	30	32	35,7	36,6	40	42	45	47	50	55	60	65	70	75	80	m
			25	22,2	19,1	17,5	15,5	14,3	12,5	12,5	11,2	10,6	9,7	9,2	8,5	7,4	6,6	5,9	5,3	4,8	4,3	t

75 m	4	►	21,6	25	27	30	32	35	39,1	40	42	45	47	50	55	60	65	70	75	m
			25	21,2	19,4	17,1	15,9	14,3	12,5	12,5	11,8	10,8	10,3	9,5	8,4	7,5	6,7	6,1	5,5	t

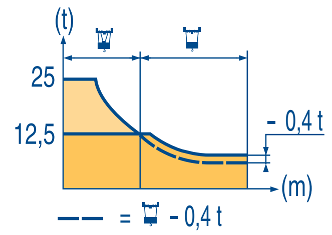
70 m	4	►	21,7	25	27	30	32	35	39,4	40,4	42	45	47	50	55	60	65	70	m
			25	21,3	19,5	17,3	16,1	14,4	12,5	12,5	11,9	11	10,4	9,6	8,6	7,6	6,9	6,2	t

60 m	4	►	21,7	25	27	30	32	35	39,4	40,4	42	45	47	50	55	60	m
			25	21,3	19,5	17,3	16,1	14,4	12,5	12,5	11,9	11	10,4	9,6	8,6	7,6	t

50 m	4	►	21,7	25	27	30	32	35	39,4	40,4	42	45	47	50	m
			25	21,3	19,5	17,3	16,1	14,4	12,5	12,5	11,9	11	10,4	9,6	t

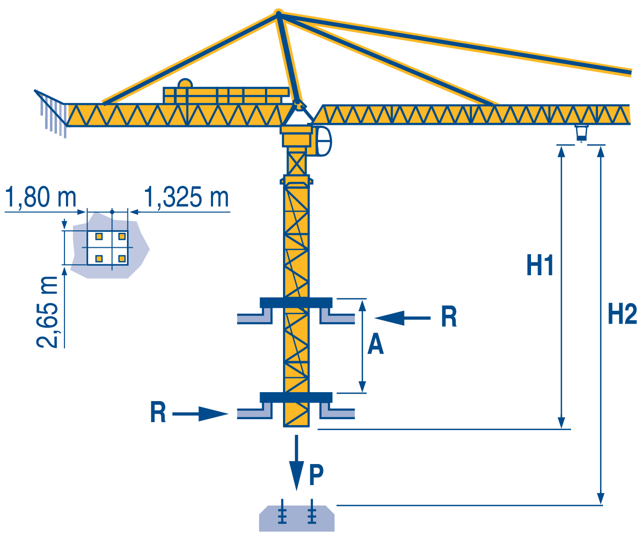
40 m	4	►	21,7	25	27	30	32	35	39,4	40	m
			25	21,3	19,5	17,3	16,1	14,4	12,5	12,5	t

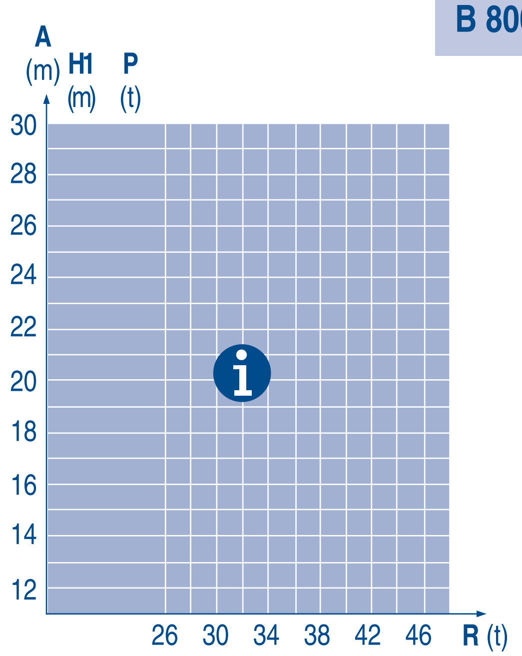
LWB 2



Télescopage sur dalles / Kletterkrane im Gebäude / Climbing crane / Telescopage gruas trepadoras / Gru in cavedio / Telescopagem sobre lages

B 800 B





LWB 2

	F	D	GB	E	I	P
A	Distance entre cadres	Abstand zwischen den Rahmen	Distance between collars	Distancia entra marcos	Distanza fra i telai	Distância entre quadros
H1	Hauteur grue	Kranhöhe	Crane height	Altura grúa	Altezza gru	Altura da grua
P	Poids de la grue (en service)	Krangewicht (in Betrieb)	Crane weight (in service)	Peso de la grúa (en servicio)	Peso della gru (in servizio)	Peso da grua (em serviço)
R	Réaction horizontale	Horizontalkräfte	Horizontal reaction	Reaccion horizontal	Reazione orizzontale	Reacção horizontal
i	Nous consulter	Auf Anfrage	Consult us	Consultarnos	Consultateci	Consultar-nos

POTAIN

														ch - PS hp	kW	
Levage	75 LVF 40	16 t	m/min	2,8	34	44	62	80	1,3	17	22	31	40	75	55	553 m
			t	8	8	6	4	2	16	16	12	8	4			> 553
Levage	150 LCC 40	16 t	m/min	60	72	90	120	144	30	36	45	60	72	150	110	947 m
			t	8	6	4	2	1	16	12	8	4	2			> 947
Distribution	6 DVF 6	16 t	m/min	0 → 42 (16 t) - 0 → 84 (8 t) - 0 → 100 (4 t)										5,5	4	

														ch - PS hp	kW	
Levage	150 LCC 50	20 t	m/min	52	62	78	102	124	26	31	39	51	62	150	110	583 m
			t	10	7,5	5	2,5	1,25	20	15	10	5	2,5			> 583
Levage	250 LCC 50	20 t	m/min	74	98	124	156	176	37	49	62	78	88	250	180	1018 m
			t	10	7,5	5	2,5	1,25	20	15	10	5	2,5			> 1018
Levage	150 LCC 63	25 t	m/min	40	48	60	80	96	20	24	30	40	48	150	110	461 m
			t	12,5	9,4	6,25	3,1	1,6	25	18,75	12,5	6,25	3,2			> 461
Levage	250 LCC 63	25 t	m/min	64	86	108	136	154	32	43	54	68	77	250	180	898 m
			t	12,5	9,4	6,25	3,1	1,6	25	18,75	12,5	6,25	3,2			> 898
Distribution	15 DVF 16	20 t	m/min	0 → 47 (20 t) - 0 → 63 (10 t) - 0 → 76 (5 t) - 0 → 100 (2,5 t)										15	11	
		25 t	m/min	0 → 47 (25 t) - 0 → 63 (12,5 t) - 0 → 76 (6,25 t) - 0 → 100 (3,1 t)												

Orientation	RVF 192 Optima	tr/min U/min rpm	0 → 0,6	2 x 15	2 x 11

CEI 38 / IEC 38	STANDARD kVA PILOT	
400 V (+6% -10%) 50 Hz	75 LVF - 6 DVF : 105 kVA 150 LCC - 6 DVF : 180 kVA 150 LCC - 15 DVF : 190 kVA 250 LCC - 15 DVF : 320 kVA	84/534 - 87/405

LWB 2

F	D	GB	E	I	P
Levage	Heben	Hoisting	Elevación	Sollevamento	Elevação
Distribution	Katzfahren	Trolleying	Distribución	Ditribuzione	Distribuição
Orientation	Schwenken	Slewing	Orientación	Rotazione	Rotação
Translation	Kranfahren	Travelling	Traslación	Traslazione	Translação
Conforme aux directives CEE 84/534 et 87/405 sur le niveau acoustique	Gemäss EWG-Richtlinien 84/534 und 87/405 für den Schall-Leistungspegel	In compliance with the EEC 84/534 and 87/405 Instructions on noise level	Conforme con las directivas CEE 84/534 y 87/405 sobre el nivel acustico	Conforme alle direttive CEE 84/534 e 87/405 sul livello acustico	Conforme as directivas CEE 84/534 e 87/405 sobre o nível acústico
Fonction Dialog Pilot possible	Funktion Dialog Pilot möglich	Dialog Pilot function possible	Funcion Dialog Pilot Posible	Possibilità di funzione Dialog Pilot	Função Dialog Pilot possivel

Modifications réservées Änderungen vorbehalten Subject to modification Modificaciones reservadas Modifiche riservate Reserva de modificações

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POTAIN

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Manitowoc Crane Group

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Portugal
POTAIN Portugal Tel : 22.968.08.89
Singapore
MANITOWOC POTAIN PTE LTD Tel : 227.15.50

MD 550

Réf. 2001.38 LWB 2

Réalisation HeadLines

```
                                         REACTIONS SOUS BOGGIES (SANS COEFFICIENT) +/- 0.5 T              CHASSIS
                                         STRESSES UNDER BOGGIES (WITHOUT COEFFICIENT)                     BASE
                                         DRUCK UNTER BOGGIES (OHNE BEIWERT)                               UNTERWAGEN
+                                                                                                                     8.00 X  8.00 M


        !                 EN SERVICE - IN SERVICE - IM BETRIEB                 ! !              HORS SERVICE - OUT OF SERVICE    !
        !                                                                      ! !                            - AUSSER BETRIEB    !
        !   VENT ARRIERE / FLECHE   !    !      PERPENDICULAIRE      !
        !     REAR WIND  / JIB      !    !       PERPENDICULAR       !
        !   RUECKENWIND /AUSLEGER   !    !         SENKRECHT         !


     Y                *                                *                                                *
     !                *                                *                                                *
     !                *                *               *                *                               *                  *
 X----                *              *                 *              *                                 *                *
          D---C     D-*-C      D---*       D---C     D-*-C      D---*                   D---C       D-*-C         D---*
  HSC    ***O******* ( O )      ( O )     ***O******* ( O )      ( O )     MAX          ***O*******  ( O )         ( O )       MAX
  LEST    A---B     A-*-B      *---B       A---B     A-*-B      *---B                   A---B       A-*-B         *---B
                      *                                *                                                *
   M      D   C                                                       ----> TR
          A   B          COUPLE DE TORSION MAXI - MAXIMUM SLEWING TORQUE - MAXIMALES TORSIONSMOMENT:
+                                                                                                    56096.  M.DAN
         TX   TY         TX : EFFORT TRANCHANT TOTAL - TOTAL SHEARING FORCE - GESAMT QUERKRAFT / X
                         TY : EFFORT TRANCHANT TOTAL - TOTAL SHEARING FORCE - GESAMT QUERKRAFT / Y
                              (TORSION NON INCLUSE - TORQUE NOT INCLUDED - OHNE TORSIONSMOMENT)
```

18.3	46	89	85	90	66	98	41	76	72	94	66	95	98	81	42	42	42	61	34	89
72	46	90	46	50	37	70	59	94	41	63	40	70		81	42	81	81	89	61	
	7.4	0.1	2.5	5.0	6.4	3.9	2.5	7.9	10.4	0.1	10.7	2.0		13.2	0.0	0.0	13.2	10.6	10.6	
20.0	45	90	86	91	66	99	41	76	72	95	70	40	99	81	42	42	42	62	35	89
72	46	91	45	50	37	70	60	95	41	64	96	66		81	42	81	81	89	62	
	7.5	0.1	2.5	5.0	6.5	3.9	2.6	8.0	10.5	0.1	0.7	8.4		13.6	0.0	0.0	13.6	10.9	10.9	
21.7	45	91	86	91	66	100	40	76	71	96	71	40	100	81	43	43	43	62	35	89
72	46	91	45	50	36	71	61	96	40	65	97	66		81	43	81	81	89	62	
	7.6	0.1	2.6	5.1	6.6	4.0	2.6	8.1	10.6	0.1	0.9	8.6		13.9	0.0	0.0	13.9	11.2	11.2	
23.3	45	92	87	92	66	101	40	76	71	97	71	39	101	82	43	43	43	62	35	90
72	45	92	45	51	36	71	62	97	40	67	98	66		82	43	82	82	90	62	
	7.7	0.1	2.6	5.2	6.6	4.1	2.6	8.2	10.7	0.1	1.2	8.7		14.3	0.0	0.0	14.3	11.5	11.5	
25.0	45	93	87	93	66	102	39	76	70	99	72	39	102	82	44	44	44	63	36	90
72	45	93	45	51	36	72	62	99	39	68	99	66		82	44	82	82	90	63	
	7.8	0.1	2.6	5.3	6.7	4.2	2.6	8.3	10.8	0.1	1.4	8.9		14.6	0.0	0.0	14.6	11.8	11.8	
26.7	45	94	88	94	67	103	39	76	70	100	72	38	103	82	44	44	44	63	36	90
72	45	94	45	51	35	72	63	100	39	69	100	67		82	44	82	82	90	63	
	7.9	0.1	2.6	5.4	6.8	4.2	2.6	8.4	10.9	0.1	1.7	9.0		15.0	0.0	0.0	15.0	12.1	12.1	
28.3	45	94	88	95	67	104	38	75	69	101	73	38	104	83	44	44	44	63	36	91
72	45	95	45	51	35	73	64	101	38	70	102	67		83	44	83	83	91	63	
	8.0	0.1	2.6	5.5	6.9	4.3	2.6	8.4	11.0	0.1	1.9	9.1		15.3	0.0	0.0	15.3	12.4	12.4	

```
                                    REACTIONS SOUS BOGGIES (SANS COEFFICIENT) +/- 0.5 T          CHASSIS
                                    STRESSES UNDER BOGGIES (WITHOUT COEFFICIENT)                 BASE
                                    DRUCK UNTER BOGGIES (OHNE BEIWERT)                           UNTERWAGEN
+                                                                                                     8.00 X  8.00 M


      !                EN SERVICE - IN SERVICE - IM BETRIEB               ! !             HORS SERVICE - OUT OF SERVICE    !
      !                                                                   ! !                          - AUSSER BETRIEB    !
      !  VENT ARRIERE / FLECHE   !    !      PERPENDICULAIRE      !
      !    REAR WIND  / JIB      !    !      PERPENDICULAR        !
      !  RUECKENWIND /AUSLEGER   !    !        SENKRECHT          !


    Y               *                                *                                                *
    !               *                                *                                                *
    !               *                *               *                *                               *                  *
 X----              *              *                 *              *                                 *                *
        D---C     D-*-C      D---*      D---C      D-*-C      D---*                 D---C        D-*-C        D---*
  HSC  ***O******* ( O )      ( O )    ***O******* ( O )      ( O )     MAX        ***O*******   ( O )        ( O )       MAX
  LEST  A---B     A-*-B      *---B      A---B      A-*-B      *---B                 A---B        A-*-B        *---B
                    *                                *                                             *
   M     D   C                                                    ----> TR
         A   B         COUPLE DE TORSION MAXI - MAXIMUM SLEWING TORQUE - MAXIMALES TORSIONSMOMENT:
+                                                                                                56096.  M.DAN
        TX   TY        TX : EFFORT TRANCHANT TOTAL - TOTAL SHEARING FORCE - GESAMT QUERKRAFT / X
                       TY : EFFORT TRANCHANT TOTAL - TOTAL SHEARING FORCE - GESAMT QUERKRAFT / Y
                            (TORSION NON INCLUSE - TORQUE NOT INCLUDED - OHNE TORSIONSMOMENT)
```

30.0	44	95	89	96	67	105	38	75	69	102	73	37	105	83	45	45	45	64	37	91
72	45	96	44	51	35	73	65	102	38	71	103	67		83	45	83	83	91	64	
	8.1	0.1	2.6	5.6	7.0	4.4	2.6	8.5	11.1	0.1	2.2	9.2		15.7	0.0	0.0	15.7	12.7	12.7	
31.7	44	96	90	97	67	107	37	75	68	103	74	37	107	83	45	45	45	64	37	91
72	45	97	44	51	34	74	66	103	37	72	104	67		83	45	83	83	91	64	
	8.2	0.1	2.6	5.7	7.1	4.5	2.6	8.6	11.2	0.1	2.4	9.3		16.0	0.0	0.0	16.0	13.0	13.0	
33.3	44	97	90	98	67	108	37	75	68	105	74	36	108	84	45	45	45	65	37	92
72	44	98	44	51	34	74	67	105	37	74	105	67		84	45	84	84	92	65	
	8.3	0.1	2.6	5.7	7.1	4.6	2.7	8.7	11.3	0.1	2.7	9.4		16.4	0.0	0.0	16.4	13.3	13.3	
35.0	44	98	91	98	68	109	36	75	67	106	75	36	109	84	46	46	46	65	38	92
72	44	98	44	51	33	75	68	106	36	75	106	68		84	46	84	84	92	65	
	8.4	0.1	2.7	5.8	7.2	4.6	2.7	8.8	11.4	0.1	2.9	9.5		16.7	0.0	0.0	16.7	13.6	13.6	
36.7	44	99	91	99	68	110	36	74	107	67	75	35	110	84	46	46	46	65	38	92
72	44	99	44	51	33	75	69	107	76	36	108	68		84	46	84	84	92	65	
	8.5	0.1	2.7	5.9	7.3	4.7	2.7	8.9	11.4	0.1	3.1	9.6		17.1	0.0	0.0	17.1	13.9	13.9	
38.3	43	100	92	100	68	111	35	74	66	108	68	109	111	85	46	46	46	66	38	93
72	44	100	43	52	32	76	69	108	35	77	34	76		85	46	85	85	93	66	
	8.6	0.1	2.7	6.0	7.4	4.8	2.7	9.0	11.5	0.1	12.3	0.8		17.4	0.0	0.0	17.4	14.2	14.2	
40.0	43	101	93	101	68	112	35	74	66	110	68	110	112	85	47	47	47	66	39	93
72	44	101	43	52	32	76	70	110	35	78	34	76		85	47	85	85	93	66	
	8.7	0.1	2.7	6.1	7.5	4.9	2.7	9.1	11.6	0.1	12.4	1.0		17.8	0.0	0.0	17.8	14.5	14.5	

```
                                        REACTIONS SOUS BOGGIES (SANS COEFFICIENT) +/- 0.5 T                CHASSIS
                                        STRESSES UNDER BOGGIES (WITHOUT COEFFICIENT)                       BASE
                                        DRUCK UNTER BOGGIES (OHNE BEIWERT)                                 UNTERWAGEN
+                                                                                                                      8.00 X  8.00 M


         !                EN SERVICE - IN SERVICE - IM BETRIEB                ! !                HORS SERVICE - OUT OF SERVICE    !
         !                                                                    ! !                              - AUSSER BETRIEB    !
         !   VENT ARRIERE / FLECHE   !    !       PERPENDICULAIRE      !
         !     REAR WIND  / JIB      !    !       PERPENDICULAR        !
         !   RUECKENWIND /AUSLEGER   !    !         SENKRECHT          !


      Y                  *                                *                                                 *
      !                  *                                *                                                 *
      !                  *                *               *                *                                *                  *
  X----                  *              *                 *              *                                  *                *
          D---C       D-*-C       D---*       D---C       D-*-C       D---*                 D---C       D-*-C       D---*
   HSC   ***O*******  ( O )       ( O )     ***O*******  ( O )       ( O )      MAX       ***O*******  ( O )       ( O )        MAX
   LEST   A---B       A-*-B       *---B       A---B       A-*-B       *---B                 A---B       A-*-B       *---B
                         *                                *                                                 *
    M       D    C                                                           ----> TR
            A    B           COUPLE DE TORSION MAXI - MAXIMUM SLEWING TORQUE - MAXIMALES TORSIONSMOMENT:
+                                                                                                         56096.  M.DAN
           TX    TY          TX : EFFORT TRANCHANT TOTAL - TOTAL SHEARING FORCE - GESAMT QUERKRAFT / X
                             TY : EFFORT TRANCHANT TOTAL - TOTAL SHEARING FORCE - GESAMT QUERKRAFT / Y
                                  (TORSION NON INCLUSE - TORQUE NOT INCLUDED - OHNE TORSIONSMOMENT)


  41.7   43  102    93  102    68  114    34   74    65  111    77   33    114        85   47     47   47     66   39        93
    72   43  102    43   52    31   77    71  111    34   80   112   68               85   47     85   85     93   66
        8.8  0.1   2.7  6.2   7.6  4.9   2.7  9.1  11.7  0.1   3.8  9.9             18.1  0.0    0.0 18.1   14.8 14.8

  43.3   42  103    94  103    68  115    33   73    65  112    77   32    115        86   47     47   47     67   39        94
    72   43  103    42   52    31   77    72  112    33   81   113   68               86   47     86   86     94   67
        8.9  0.1   2.7  6.3   7.6  5.0   2.7  9.2  11.8  0.1   4.0 10.0             18.5  0.0    0.0 18.5   15.1 15.1

  45.0   42  104    95  104    69  116    33   73    64  113    69  115    116        86   48     48   48     67   40        94
    72   43  104    42   52    30   78    73  113    33   82    32   78               86   48     86   86     94   67
        9.0  0.1   2.7  6.3   7.7  5.1   2.7  9.3  11.9  0.1  12.7  1.6             18.8  0.0    0.0 18.8   15.3 15.3

  46.7   42  105    95  105    69  117    32   73    63  115    78   31    117        87   48     48   48     67   40        94
    72   42  105    42   52    30   78    74  115    32   84   116   69               87   48     87   87     94   67
        9.1  0.1   2.7  6.4   7.8  5.2   2.8  9.4  12.0  0.1   4.5 10.1             19.2  0.0    0.0 19.2   15.6 15.6

  48.3   42  105    96  106    69  119    32   73    63  116    69  118    119        87   48     48   48     68   40        95
    72   42  106    42   52    29   79    75  116    32   85    30   79               87   48     87   87     95   68
        9.2  0.1   2.8  6.5   7.9  5.2   2.8  9.5  12.1  0.1  12.8  2.0             19.5  0.0    0.0 19.5   15.9 15.9

  50.0   41  106    96  107    69  120    31   72    62  117    79   29    120        87   49     49   49     68   97        97
    72   42  107    41   52    29   79    76  117    31   86   119   69               87   49     87   87     39   68
        9.3  0.1   2.8  6.6   8.0  5.3   2.8  9.6  12.2  0.1   4.9 10.2             19.9  0.0    0.0 19.9   16.2 16.2

  51.7   41  107    97  108    69  121    30   72    62  119    80   28    121        88   49     49   49     68   99        99
    72   42  108    41   52    28   80    77  119    30   87   121   69               88   49     88   88     37   68
        9.4  0.1   2.8  6.7   8.1  5.4   2.8  9.7  12.3  0.1   5.1 10.3             20.2  0.0    0.0 20.2   16.5 16.5
```

POTAIN

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MD550, pylone 2,45m - chassis 8m x 8m  - Y800A - FEM - Vent ZONEAB     19-07-2002 13:16:42     F.E.M.      PAGE R  7

                                       REACTIONS SOUS BOGGIES (SANS COEFFICIENT) +/- 0.5 T             CHASSIS
                                       STRESSES UNDER BOGGIES (WITHOUT COEFFICIENT)                    BASE
                                       DRUCK UNTER BOGGIES (OHNE BEIWERT)                              UNTERWAGEN
+                                                                                                                  8.00 X  8.00 M


        !                EN SERVICE - IN SERVICE - IM BETRIEB                 ! !               HORS SERVICE - OUT OF SERVICE    !
        !                                                                     ! !                             - AUSSER BETRIEB    !
        !   VENT ARRIERE / FLECHE   !    !      PERPENDICULAIRE      !
        !     REAR WIND  / JIB      !    !      PERPENDICULAR        !
        !   RUECKENWIND /AUSLEGER   !    !         SENKRECHT         !


     Y               *                                *                                               *
     !               *                                *                                               *
     !               *                *               *                *                              *                  *
  X----              *              *                 *              *                                *                *
         D---C      D-*-C      D---*      D---C      D-*-C      D---*                   D---C       D-*-C       D---*
   HSC  ***O******* ( O )      ( O )     ***O******* ( O )      ( O )     MAX          ***O*******  ( O )       ( O )        MAX
   LEST  A---B      A-*-B      *---B      A---B      A-*-B      *---B                   A---B       A-*-B       *---B
                     *                                *                                               *
    M      D   C                                                      ----> TR
           A   B          COUPLE DE TORSION MAXI - MAXIMUM SLEWING TORQUE - MAXIMALES TORSIONSMOMENT:
+                                                                                                    56096.  M.DAN
          TX   TY         TX : EFFORT TRANCHANT TOTAL - TOTAL SHEARING FORCE - GESAMT QUERKRAFT / X
                          TY : EFFORT TRANCHANT TOTAL - TOTAL SHEARING FORCE - GESAMT QUERKRAFT / Y
                               (TORSION NON INCLUSE - TORQUE NOT INCLUDED - OHNE TORSIONSMOMENT)


  53.3   41  109    98  109    70  122    30   72    61  120    70  122    122         49   88     88   88     69  103       103
    72   41  109    41   52    27   80    78  120    30   89    27   80                49   88     49   49     35   69
        9.5  0.1   2.8  6.8   8.2  5.5   2.8  9.7  12.4  0.1  13.1  2.6              20.6  0.0    0.0 20.6   16.8 16.8

  55.0   40  110    99  110    70  124    29   71    60  121    81   26    124         48   90     90   90     69  106       106
    72   41  110    40   52    27   81    79  121    29   90   124   70                48   90     48   48     32   69
        9.6  0.1   2.8  6.9   8.2  5.5   2.8  9.8  12.5  0.1   5.5 10.4              20.9  0.0    0.0 20.9   17.1 17.1

  56.7   40  111    99  111    70  125    28   71    60  123    81   26    126         46   92     92   92     69  109       109
    72   41  111    40   52    26   81    80  123    28   91   126   70                46   92     46   46     30   69
        9.7  0.1   2.8  7.0   8.3  5.6   2.8  9.9  12.6  0.1   5.7 10.5              21.3  0.0    0.0 21.3   17.4 17.4

  58.3   39  112   100  112    70  126    28   71    59  124    82   25    127         44   95     95   95     70  113       113
    72   40  112    39   52    25   82    81  124    28   93   127   70                44   95     44   44     26   70
        9.8  0.1   2.8  7.0   8.4  5.7   2.8 10.0  12.7  0.1   5.8 10.6              21.9  0.0    0.0 21.9   17.9 17.9

  60.0   39  113   101  113    70  128    27   70    58  126    70  129    129         42   98     98   98     70  117       117
    72   40  113    39   52    25   82    82  126    27   94    24   82                42   98     42   42     23   70
        9.9  0.1   2.8  7.1   8.5  5.8   2.9 10.1  12.8  0.1  13.4  3.3              22.3  0.0    0.0 22.3   18.2 18.2

  61.7   39  114   101  115    70  129    26   70   127   58    70  131    131         41  100    100  100     70  120       120
    72   39  115    39   52    24   83    83  127    96   26    23   83                41  100     41   41     20   70
       10.0  0.1   2.9  7.2   8.6  5.8   2.9 10.2  12.9  0.1  13.4  3.4              22.6  0.0    0.0 22.6   18.5 18.5

  63.3   38  115   102  116    71  131    26   70    57  128    83   22    132         39  102    102  102     71  124       124
    72   39  116    38   52    23   83    84  128    26   97   132   71                39  102     39   39     18   71
       10.1  0.1   2.9  7.3   8.7  5.9   2.9 10.3  13.0  0.1   6.4 10.7              23.0  0.0    0.0 23.0   18.8 18.8
```

```
                                        REACTIONS SOUS BOGGIES (SANS COEFFICIENT) +/- 0.5 T             CHASSIS
                                        STRESSES UNDER BOGGIES (WITHOUT COEFFICIENT)                    BASE
                                        DRUCK UNTER BOGGIES (OHNE BEIWERT)                              UNTERWAGEN
+                                                                                                                   8.00 X  8.00 M


         !                 EN SERVICE - IN SERVICE - IM BETRIEB                 ! !               HORS SERVICE - OUT OF SERVICE    !
         !                                                                      ! !                             - AUSSER BETRIEB    !
         !  VENT ARRIERE / FLECHE   !    !      PERPENDICULAIRE      !
         !    REAR WIND  / JIB      !    !      PERPENDICULAR        !
         !  RUECKENWIND /AUSLEGER   !    !        SENKRECHT          !


      Y                *                                *                                               *
      !                *                                *                                               *
      !                *                *               *                *                              *                  *
  X----                *              *                 *              *                                *                *
          D---C       D-*-C       D---*       D---C       D-*-C       D---*                  D---C       D-*-C        D---*
   HSC   ***O******* ( O )       ( O )      ***O******* ( O )        ( O )     MAX         ***O*******   ( O )        ( O )       MAX
   LEST   A---B       A-*-B       *---B       A---B       A-*-B       *---B                  A---B       A-*-B        *---B
                       *                                *                                               *
   M       D   C                                                      ----> TR
           A   B          COUPLE DE TORSION MAXI - MAXIMUM SLEWING TORQUE - MAXIMALES TORSIONSMOMENT:
+                                                                                                     56096.  M.DAN
          TX   TY         TX : EFFORT TRANCHANT TOTAL - TOTAL SHEARING FORCE - GESAMT QUERKRAFT / X
                          TY : EFFORT TRANCHANT TOTAL - TOTAL SHEARING FORCE - GESAMT QUERKRAFT / Y
                               (TORSION NON INCLUSE - TORQUE NOT INCLUDED - OHNE TORSIONSMOMENT)
```

65.0	38	116	103	117	71	132	25	69	56	130	84	21	134	38	105	105	105	71	128	128
72	39	117	38	52	22	84	85	130	25	98	134	71		38	105	38	38	15	71	
	10.2	0.1	2.9	7.4	8.7	6.0	2.9	10.4	13.1	0.1	6.6	10.8		23.4	0.0	0.0	23.4	19.2	19.2	
66.7	37	117	104	118	71	134	24	69	56	131	71	136	136	36	107	107	107	71	131	131
72	38	118	37	52	22	84	86	131	24	100	19	84		36	107	36	36	12	71	
	10.3	0.1	2.9	7.5	8.8	6.1	2.9	10.4	13.2	0.1	13.6	3.9		23.7	0.0	0.0	23.7	19.5	19.5	
68.3	37	118	104	119	71	135	23	69	55	133	85	18	138	34	109	109	109	72	135	135
72	38	119	37	52	21	85	87	133	23	101	138	71		34	109	34	34	8	72	
	10.4	0.1	2.9	7.6	8.9	6.1	2.9	10.5	13.3	0.1	6.9	10.9		24.1	0.0	0.0	24.1	19.8	19.8	
70.0	39	122	108	123	74	140	26	71	57	137	88	20	142	35	115	115	115	75	142	142
84	40	123	39	55	23	88	91	137	26	106	142	74		35	115	35	35	8	75	
	10.6	0.1	3.0	7.7	9.1	6.2	3.0	10.7	13.6	0.1	7.2	11.0		24.6	0.0	0.0	24.6	20.2	20.2	
71.7	39	123	109	124	74	141	25	71	139	56	89	19	144	33	117	117	117	75	146	146
84	40	124	39	55	22	89	92	139	107	25	144	74		33	117	33	33	5	75	
	10.7	0.1	3.0	7.8	9.2	6.3	3.1	10.7	13.7	0.1	7.3	11.0		25.0	0.0	0.0	25.0	20.5	20.5	
73.3	39	124	110	125	75	143	24	71	140	56	89	18	146	31	120	120	120	76	150	150
84	40	125	39	54	21	89	93	140	108	24	146	75		31	120	31	31	2	76	
	10.8	0.1	3.1	7.9	9.3	6.4	3.1	10.8	13.8	0.1	7.5	11.1		25.3	0.0	0.0	25.3	20.8	20.8	

CHASSIS – INSTALLATION

On travelling gear

Execution of tracks

Choosing the track

The track dimensions must correspond to:

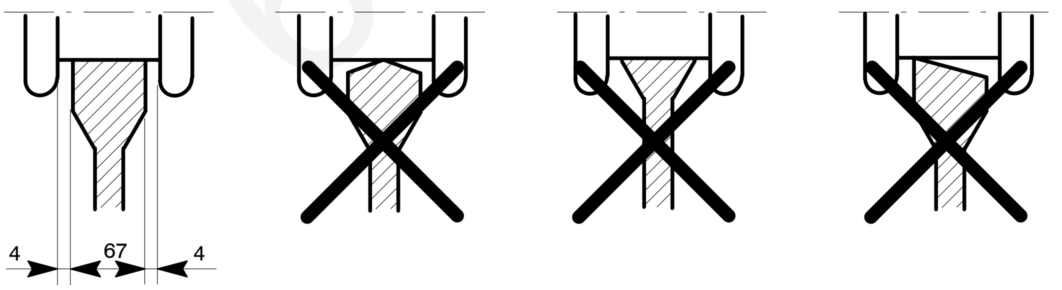
- the equipment which determines:
  - the track width and the radius of curvature
  - a reaction per corner depending on its working height
- the ground homogeneity or non homogeneity of its pressure
- the types of tracks:
  - on longitudinal concrete sleepers
  - on wooden sleepers

Certain conditions under which the machine will be used may require an "out of service" anchorage pad.

Track laying

Rail to be used

- The rail section must be suitable for the wheels it will support; maximum head width 67 mm. The best rail to use is one which is slightly worn as this has a good bearing surface. It is preferable to use standardized material (rails and accessories).
- The user must choose the other dimensional characteristics of the rail according to how latter will be connected to the longitudinal concrete sleeper or to the HEB girder and according to the maximum vertical or horizontal reactions.
- The horizontal reaction amounts to about 10 % of the vertical reaction.



good | new rail | rail too worn out | rail worn on one side

Track laying

- The track must be carefully designed and laid. It must be:
  - perfectly level (longitudinally and transversely),
  - well bedded down on a solid base,
  - perfectly straight and with the rails absolutely parallel,
  - made up of the same type of rails throughout its length,
  - fitted with rail stops placed at least 1 m before the end sleeper,
  - correctly earthed,

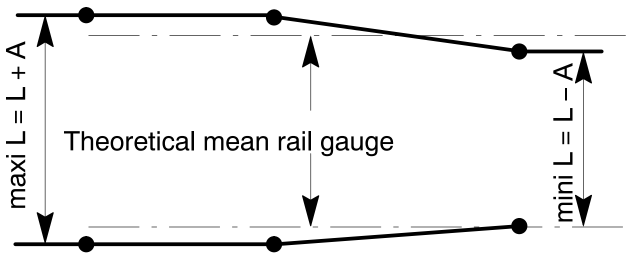
CURRENT SUPPLY

For the erection, a minimum track length is required, at least 2 x the chassis wheel base.

The following drawings are given as an indication only. They exclusively apply to a homogeneous soil with a resistance of at least 2 kg/cm2. The crane user is responsible for the laying of the track which must be perfectly level and capable to take the maximum bogie reaction of the machine without causing any local subsidence.
The substructure elements participate in the good working order and the stability of the crane. Therefore, it is compulsory to observe the instructions and tolerances defined for each element.

Track tolerances for site cranes

Mean rail gauge (L)

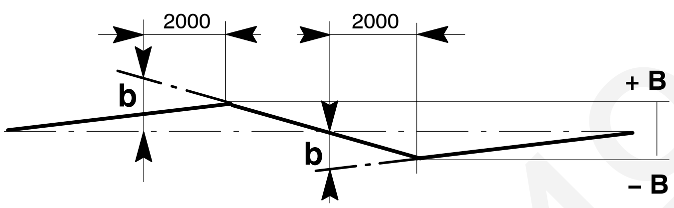


L < 15 m : A = ± 5 mm

L>15 m : A = ±[5 + 0,25(L–15)] mm

with L (m)

Top view of the position of one rail

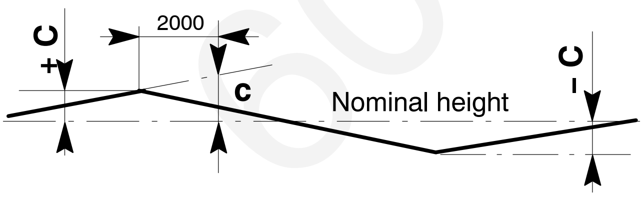


B = ± 10 mm

b = ± 1 mm **

** = This dimension must not be exceeded over a measuring length of 2m

Level of one rail (gradient)

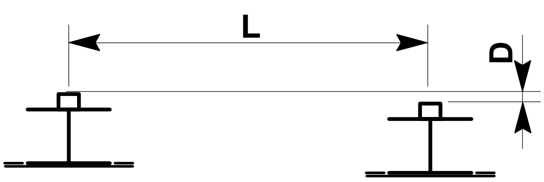


C = ± 10 mm

c = ± 2 mm **

** = This dimension must not be exceeded over a measuring length of 2m

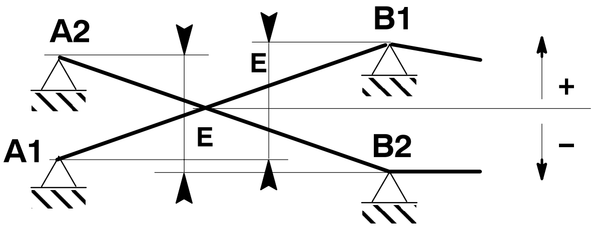
Level of one rail with respect to the other (transversal slope)



D = ± 1 $^{0}/_{00}$ of L

maxi ± 10mm

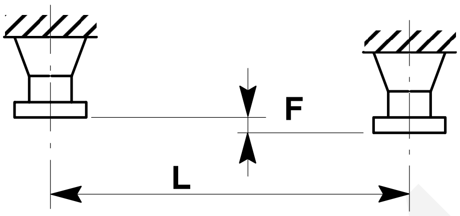
Inclination of one rail with respect to the other (crossing)



$E = 0{,}5\ ^{0}/_{00}$

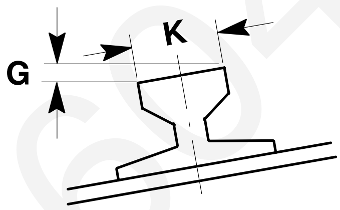
E = Inclination A1 B1 – Girder 1
E = Inclination A2 B2 – Girder 2

Position of the buffers, one with respect to the other



$F = \pm 1\ ^{0}/_{00}$ of L
maxi ± 20mm

Inclination of the rail head tread (K) with respect to the horizontal line



$G = \pm 8\ ^{0}/_{00}$ of the rail head width (K) (with respect to the horizontal line)

Track end accessories

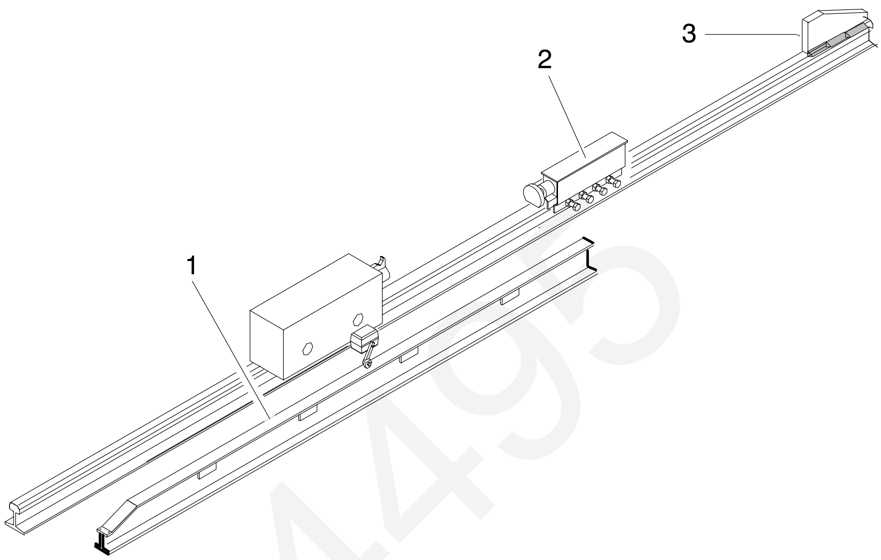
Track end stops

We remind you that the crane when approaching the track end must be stopped before hitting the safety devices.

These devices are not working systems.

There are three devices which are fitted as shown in the following drawing:

- Travelling limit switch and travelling overrun limit switch (optional) (1)
- Spring buffer (shock–absorber) (2)
- Fixed bumper, welded on the rail (3)



These devices are prescribed by the Safety Authorities and must be fitted and adjusted with particular care.

SAFETY DEVICES

The mounting of device (1) is described in the relevant section of the catalogue.

Travelling limit switch and overrun limit switch

Check that the ramp (1) is parallel to the rail so that the limit switch roller does not leave the ramp.

The supply and fixing of the devices (1), (2), (3), are the responsability of the user.

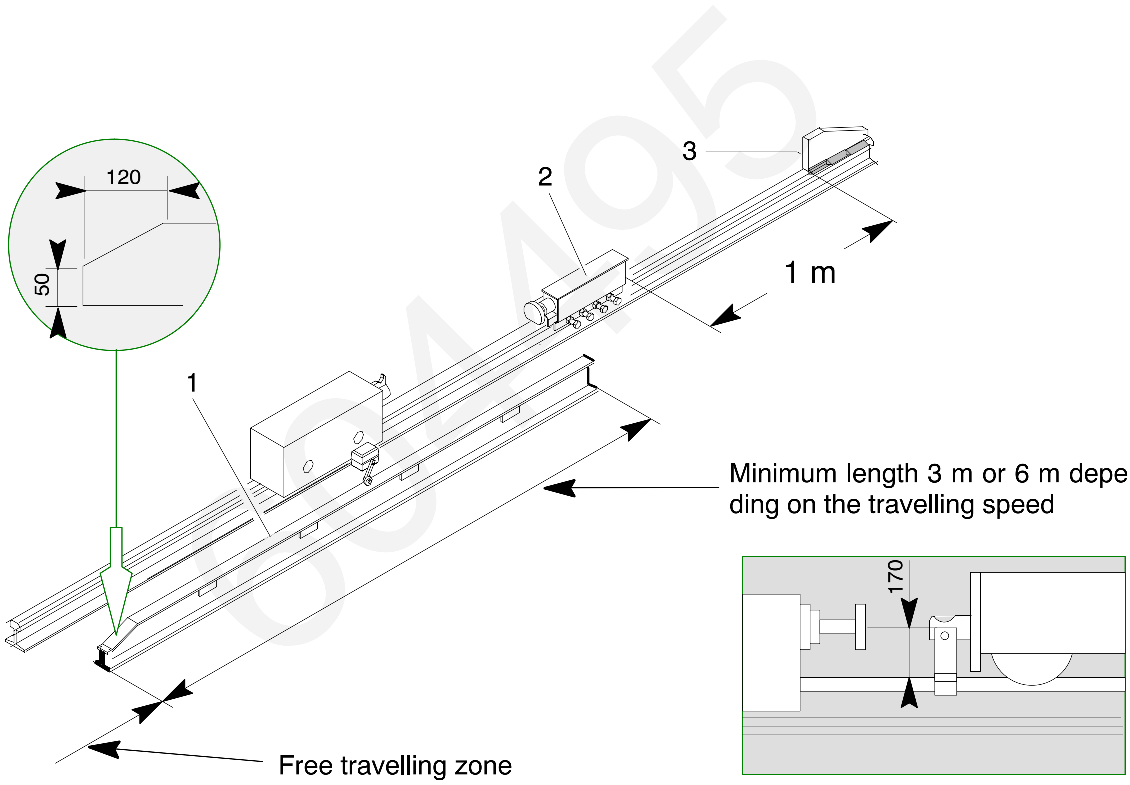
The device (2) can be fixed onto the rail by clamping, various models are available from specialized suppliers.

When choosing these devices, pay attention to the crane weight (buffering capacity) and the buffer height which must correspond to that of the stop on the bogies.

The device (3) must be welded onto the rail and must have the appropriate dimensions in order to avoid any derailing of the crane at track end. The following drawing serves as an indication only.

Each track end is to be fitted with two buffers; it is essential that they are positioned exactly so that they act together.

Track tolerances for site cranes



Preparing the tracks and the base ballast

Fabrication rules for reinforced concrete

Concrete and reinforcement determined according to the B.A.E.L. (reinforced concrete boundary condition) Rules, 1989.

Concrete

- **ftj** = characteristic tensile strength of the j days old concrete
- **fcj** = characteristic compressive strength of the j days old concrete

In any case, the compressive strength is measured by axial pressure of the cylinder having a periphery of 200 cm2 cross section and a height which is the double of its diameter (16 cm). These dimensions suppose an aggregate size of at least equal to 40 mm, a condition generally fulfilled for reinforced concrete.

The dimensions and characteristics of the reinforcements and of the concrete for the execution of concrete works indicated in this manual, are defined by a compressive strength value at 28 days old (j = 28).

Reinforced concrete mixing of 350 kg/m^3 – CPA45

that means, for 1 m^3 of sand with gravel:350 kg PORTLAND cement 45.

For a vibrated concrete correctly prepared, we obtain:

- **fc28** = 20 MPa
- **ft28** = 0,6+0,06 x fc28 = 1,8 MPa
- **P** = Weight of reinforced concrete in kg
- **D** = Average density of reinforced concrete equal to about 2,35

Steel (except other indications)

Es: Longitudinal modulus of elasticity of steel: 200 000 N/mm^2 i.e. 200 000 MPa

Type 1: Reinforcement with high adherence obtained by hot–rolling of natural high–carbon steel.

Quality: Fe E 50 i.e. fe = 500 MPa

If the above rules are not applicable, refer to the rules applied in the user country.

Tracks on longitudinal sleeper – explanation and symbols

(Example)

3 HA 10 x 1100 e : 15

3	:	Number of bars
HA	:	Round steel with high adherence
10	:	Round steel with high adherence
1100	:	Unit length of iron in cm
e	:	Spacing in cm

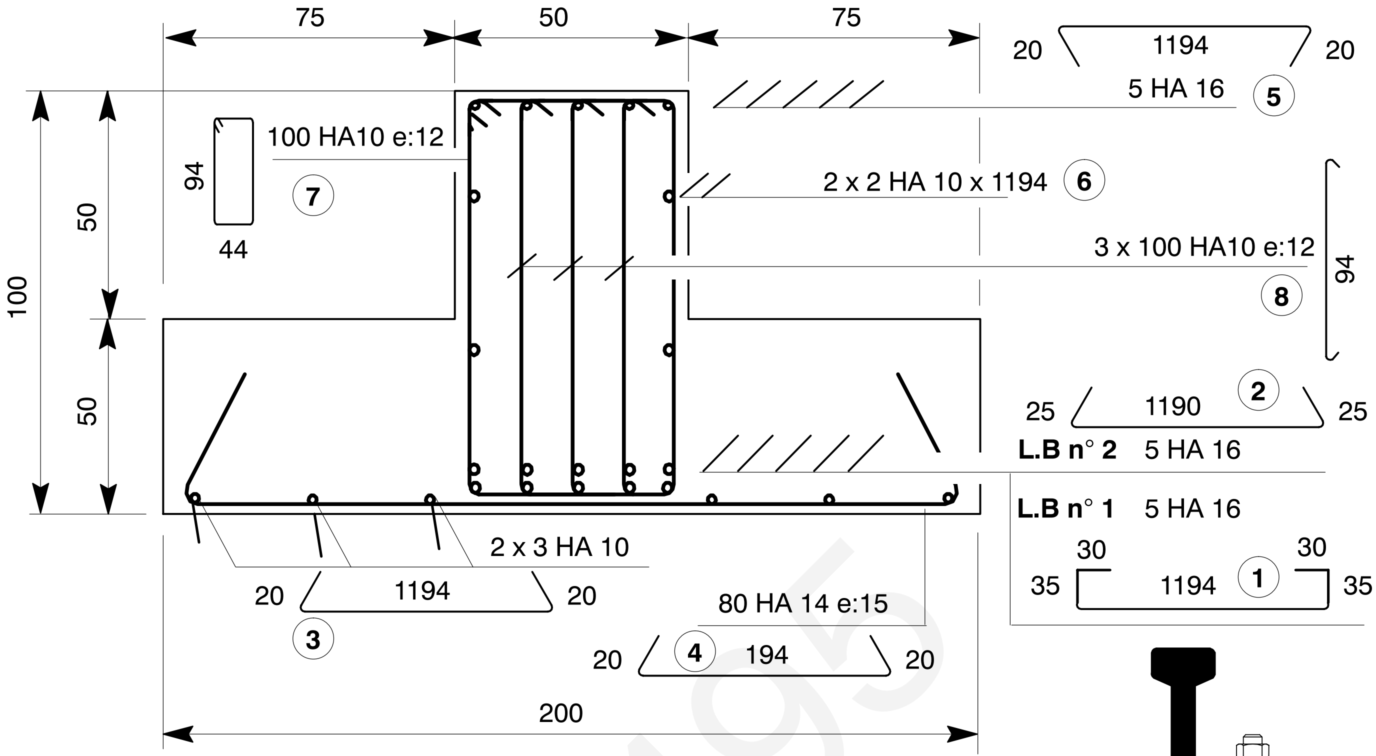
(Example)

201 cad 10 x 1100

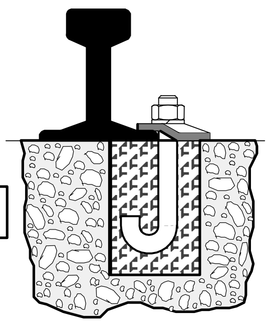
201	:	Number of frames
cad	:	Frame
10	:	Round steel with high adherence
1100	:	Unit length of iron in cm

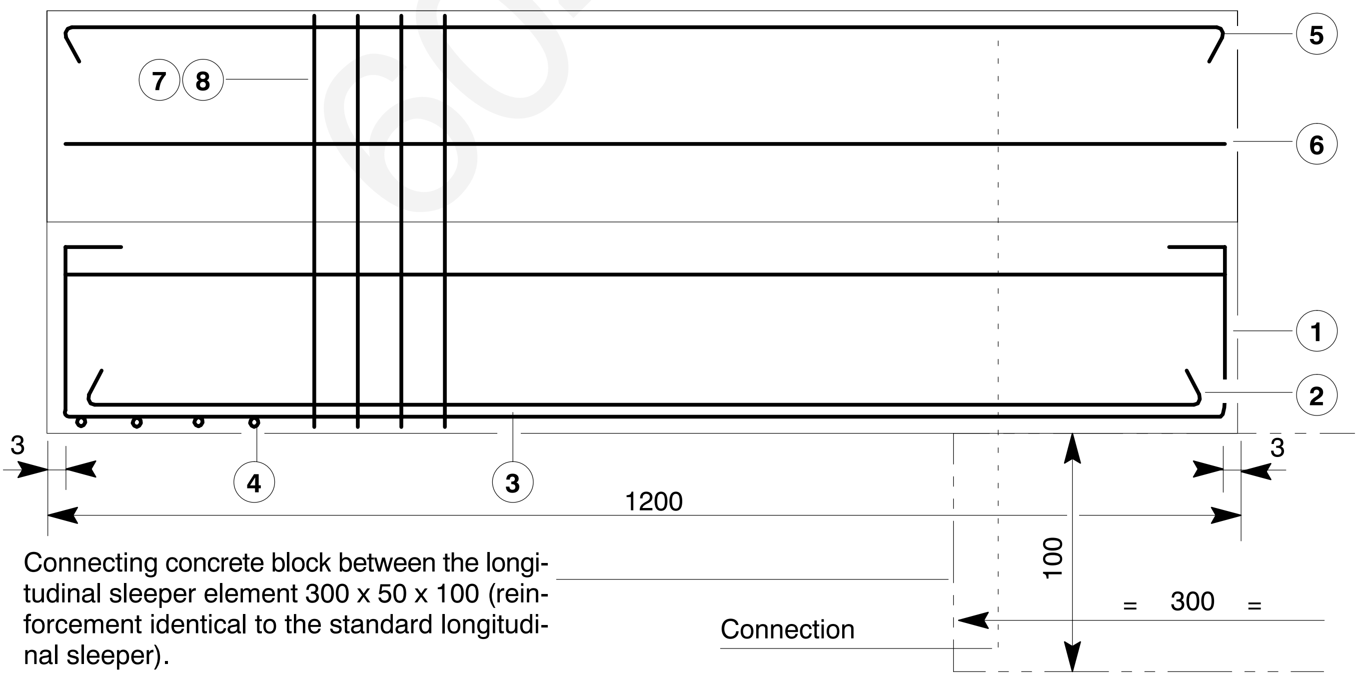
L.B.	: lower layer
L.B. n°1	: 1st lower layer
L.B. n°2	: 2nd lower layer
L.H.	: upper layer
Z.N.	: neutralized zone
A.H.B.	: overlapping upper and lower steels
P.R.	: Rail weight per m in daN
T.R..	: Rail type

Longitudinal sleeper for vertical reactions from 175t to 250t max.



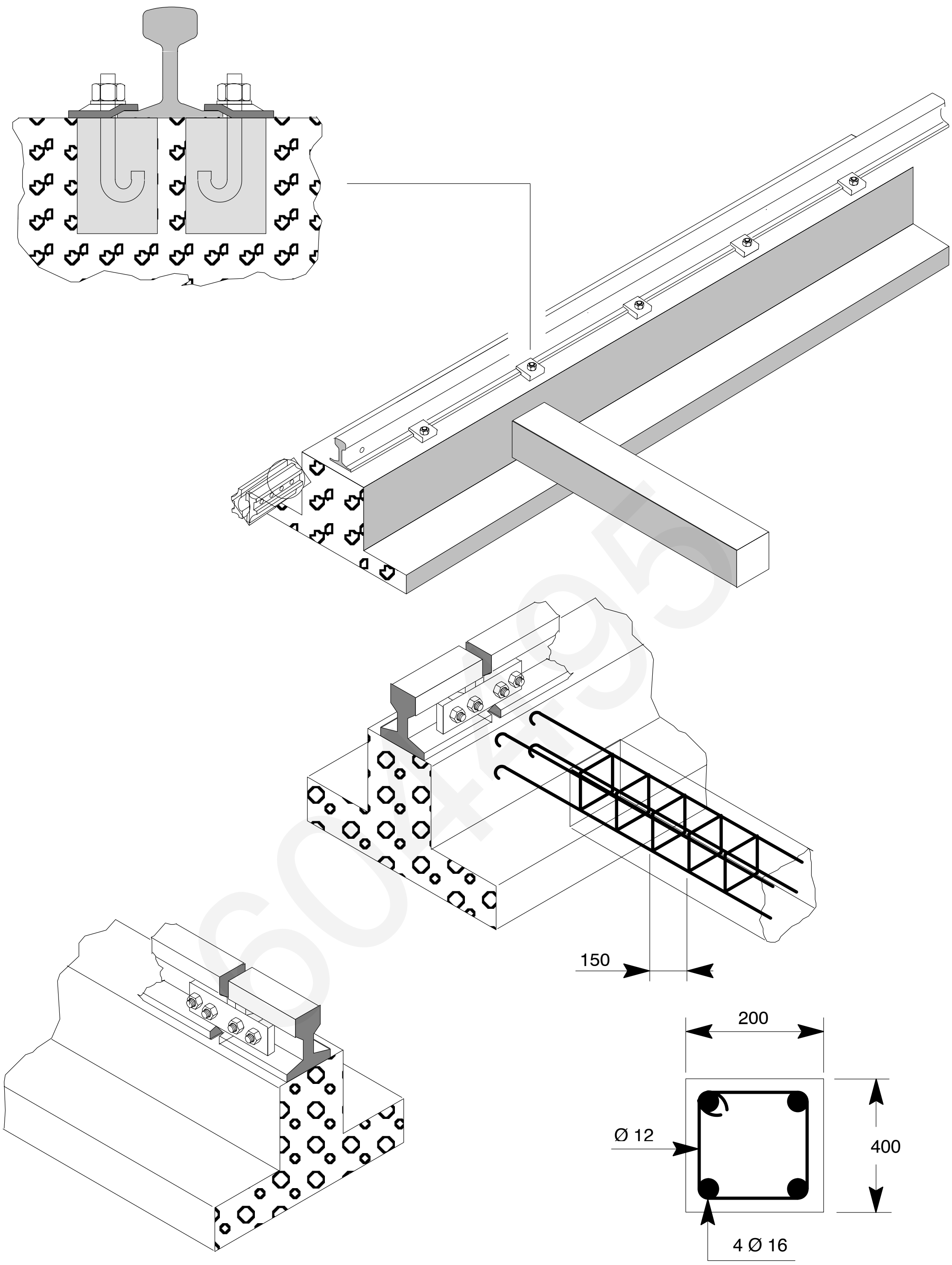
L. R. = 175 t ➨ 250t   P. R. = 50 daN   T. R. : VIGNOLE





Connecting concrete block between the longitudinal sleeper element 300 x 50 x 100 (reinforcement identical to the standard longitudinal sleeper).

Longitudinal sleeper connections



The distance between longitudinal sleeper connections is equal to the distance between centres of the track.

A J INFRAGEAR

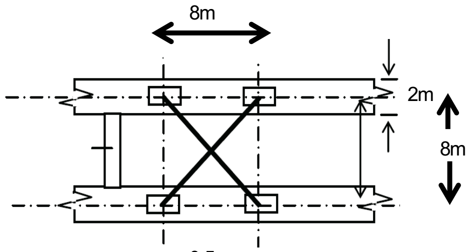
Project/Contr.Name:	**SALINI**	
Location:		
Crane Type:	**MD550**	**Y800**
Hieght:	**64.2m**	
Jib Length:	**60m**	

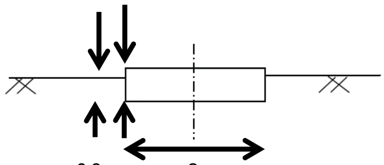
Design Standards:

Concrete Grade fcu	**40**	(N/mm2)
Steel fy	**460**	(N/mm2)
Reinforcement Cover	**65**	(mm)
Concrete Desity	**24**	N/m3
Soil Desnity	**18**	N/m3
Soil Bearing capcity	**600**	kN/m2
Factor (in servoce)	**1.5**	
Factor(Out of service)	**1.35**	

Dimensions Considered:

hassis centres, X direction Cd=	**8**	m
hassis centres, Y directionCd=	**8**	m



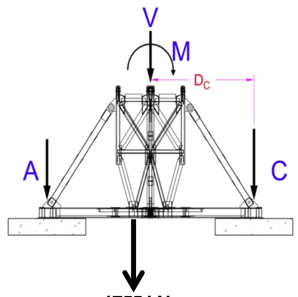


Static Chassis type

Base plate length(for Static)=	**440**	mm
Base plate length(for Static)=	**580**	mm

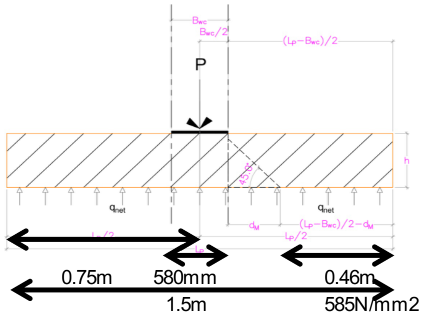
Tower Crane Loads & details :

Compressive Loads	Unit	In-Service	Out of Service
Corner A	kN	300	940
Corner B	kN	780	670
Corner C	kN	1170	400
Corner D	kN	690	670
Horizontal Loads	**Unit**	**In-Service**	**Out of Service**
Axis X	kN	78	156
Axis Y	kN	52	156
Twisting Moment	kN-M	560	0



a) Calculating length of notic]

Width of required base, B=	**2000**	**mm**
Thicknes of required base, h=	**500**	**mm**
Depth of foundation from ground level=	**0**	mm
Soil desnity=	18	N/m3
weight of soil displaced=	0	kN/m2
hence, gross bearing pressure available=	600	kN/m2
Self Weight of beam, Thicknes x Con. density=	12	kN/m2
Bearing pressure due to Bogie load=	588	kN/m2
n.length of Beam req. for notion base, Lp=		
Pmax/(B*Pb)=	**1.5**	**m**
Req. length based on bogie centres= 8+1.50	**9.5**	m(Total length)
Weight of foundation, W=	36	kN(self weight)

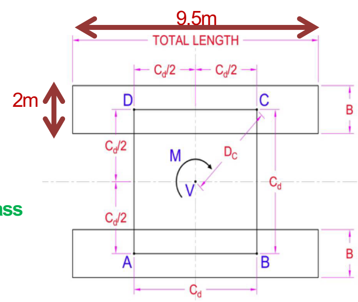


notional pad base

Stability Against Overturning Moment

Distance from the base of centre, Dc=		
√((Cd/2)2 + (Cd/2)2) =	5.7	m
Sum of Min loads, Sum(I/S, O/S)=	2680	kN
Max. Overturning moment=		
Mot, Max(I/s, O/s)*Dc=	6669	kN-m
Stablizing moement=	15276	kN-m
Stability against the Overturning moment =	2.290598291	>1.6

Pass



A J INFRAGEAR

B) Structural Design (BS8110):

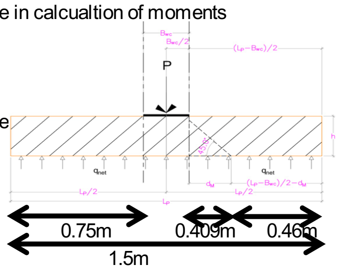
FOS for structural design= 1.4

Length of min beam is design worst case as above evaluated.

For RC design, self weight of beam is balanced by ground bearing pressure in calcualtion of moments

use Net design bearing pressure=

(P/Area of Beam)= 585 **kN/m^2**



Longitudanal Bending:

Max bendinf moement and shear force occurs at centres of whee

eccentricity = 0.460 mm

Design, ultimate moment, M= **123.786 kN-m**

effective depth, dm= 409 mm

There for k=m/bd2fc 0.009249855

Therefore, z=d{0.5+√(0.25-d/0.9) 0.9899614525 **=0.99d**

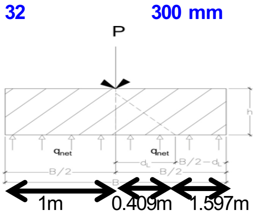
rea of Reinforcement required, As=M/(0.5fy z) **700** mm2/m provide **T 32** **300 mm**

Provided Bottom reinforcement, As= **2681** mm2 **Pass**

Top longitudanal reinforcement-provide min 0.13%

Required bottom reinforcement= 1300 mm2 provide **T 32** **300 mm**

Therefore, provided Top reinforcement, As= **2681** mm2/m



Longitudanal shear:

Design the shear force due to ultimate loads (at centre of wheels)

V= 538.2 kN

Therefore, Vmax= 0.65795 N/mm2 < 0.87x √(fcu)

= 5.5 N/mm2 **Pass**

For enhanced shear strength close to the point loads, the shear stress may be calcualted at distance d from support

(Clause 3.4.5.10, BS8110)

shear force at distance , d= 409 mm from the centreline of wheel

therefore, eccentricity= 0.051

therefore, Shear force= **60** kN

Table 3.8:- 100xAs/bvd= 0.33

Therefore, vc ≈ **0.54** (Table 3.8 BS8110)

v=V/bvd= **0.07** N/mm2 **Pass**

Therfore, 0.5vc<v<(vc+0.4), Provide min links (Applying BS8110 Table 3.7 for beams)

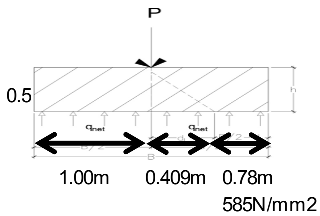
Base fixings are at 300 mm centres. so, provide the linkes at **300** mm

Asv>=04*bvsv/0.95fz = **549.2** mm2 (at 300 mm centre)

provide links **T 16** at **300** mm

Provided Bottom reinforcement, As= **670** mm2/m **Pass**

Transverse Bending :



For simplicity, ignore the width of rail

M= 292.5 kNm/m

d= 403 mm

Therefore, K= 0.0451

hence Z=d{0.5+√(0.25-k/0.9)}= 0.95 d > 0.95 d

use 0.95 d

therefore, required , As= 1748.3 mm2/m

min reinforcement 0.13%= 650 mm2/m

, reinforcement to be provided = **1748.3** mm2/m

Arrangement of links will give one full width link T16 at 300mm

provide ring T **25** at c/c **150** mm

rovided min reinforcement, As= **3273** mm2/m **Pass**

Transverse Shear:

For simplicity, ignore the width of rail

M= 585 kN/m

eccentricity= 413.595

At centre line Vmax= 1.41 **(**<0.8√(fcu)= 5.06 **)**

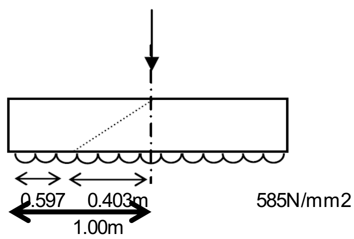
Shear force distance d= 403 mm

= 342.23 kN/m

100As/bvd= 0.81

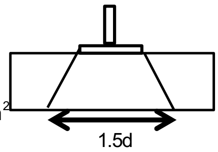
therefore Vc= **0.36** N/mm2(BS8110 Table 3.8)

hence v= **0.85** N/mm2 ****Provided****



For the transverse shear, we have a slab ratherthan a beam.

As<v<vc shear reinforcement is not required, but min links are to be provided for longitudanal shear

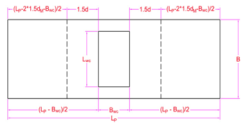


C)Punching check :

Ultimate pressure for punching shear, q net= 585 kN/m^2

Average effective depth of reinforcement, (dM + dL)/2 , d = 406 mm

Area loaded for punching shear at T. C base, AP = L_{wc}*B_{wc} = 0.2552 m^2



Length of punching shear, 2*Lwc + 2*Bwc, Up = 2040 mm

shear force at shear perimeter, Pu + (Fswt*γfi -qnet)*Ap , Vpu= 1179.57 kN

Effective shear force at shear perimeter, Vpeff = Vpu*γm = 1474.46 kN

Punching shear stress at face of T. C base (cl 3.7.7.2)

Design shear stress, vdpu = Vpeff/(Up*d) = **1.780** N/mm^2

Allowable shear stress, vmax =

min(0.8N/mm2*(fcu/1N/mm2)1/2, 5N/mm2) = **4.382** N/mm^2 **Pass**

Calculate ultimate punching shear force at the face of T. Crane base

Ultimate pressure for punching shear,qnet = 585 kN/m^2

Average effective depth of reinforcement, (dM + dL)/2 =d= 406 mm

Area loaded for punching shear at T. Crane base , AP1.5d =

=(B_{wc} + 2*1.5d)*min((L_{wc} + 2*1.5d), B) = 2.98 m^2

Length of punching shear, Up1.5d = 2*B = 4000 mm

Ultimate shear force at shear perimeter=

P_u + (F_{swt}*γ_{fi} - qnet)*$A_{p1.5d}$ = -277.69 kN

Effective shear force at shear perimeter:

from BS 8110-1:1997 (Table 2.2) Vpu1.5d*γm =

$V_{peff1.5d}$ = -347.11 kN

Punching shear stress at 1.5d of T. Crane base (cl 3.7.7.2)

Design shear stress: Vpeff1.5d/(Up1.5d*d) = vdpu1.5d = -0.214 N/mm^2

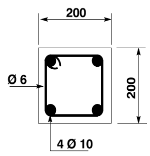
Allowable shear stress, vc=

Vc=0.79{100As/bd}1/3*(fcu/25)1/3/γm = 3.0173869 N/mm2

v_{max} =

min(0.8N/mm^2*(f_{cu}/1N/mm^2)$^{1/2}$, 5N/mm^2) = **5.000** N/mm^2 **Pass**

D) Tie Beam Design:



Max Horizontal reaction= 156 x1.4

= 218.4 kN

Required Steel Area for Ultimate tensile force acting on beam=

Ast =Tult/(0.9fy) =

required Steel Area= 527.53623 mm2/m

provide 4 nos of T 20

provided reinforcement= 1256.6371 mm2/m **Pass**

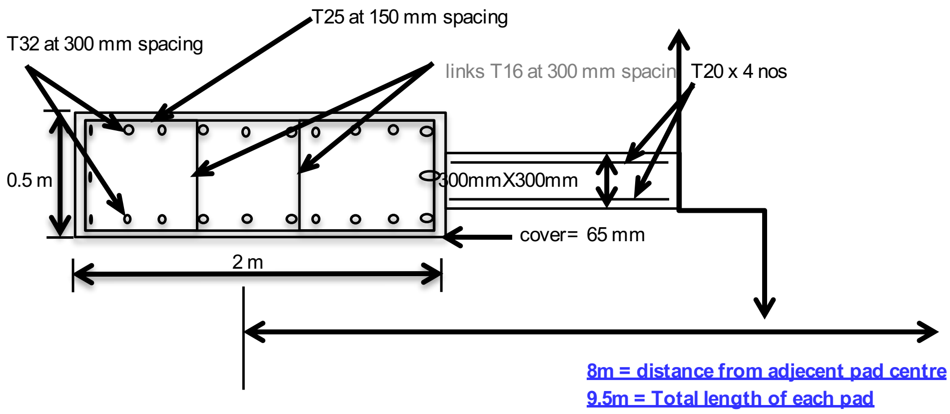
E) Sliding against Horizontal reaction:

Total Tower crane Load (W)= **2976 kN**

Friction Coeffecent (μ)= **0.6**

Max. Horizontal reaction(Hmax)= **156 kN**

Allowable Horizontal force, u*W= < **1785.6 kN** **Pass**



A2.2.2 Factors of safety

For each of the failure modes a minimum factor of safety is recommended in this report for each of the two approaches. The factors have been selected as representing current practice in accordance with British Standards or have been derived from the principles of BSEN1997-1, and have been based on current practice.

Stability (equilibrium)

The same factor of safety has been used for both approaches, derived from BSEN 1997-1. The partial factors recommended by BSEN 1997-1 relate to the effects of the destabilising actions and the stabilising actions. Different partial factors relate to actions that are permanent or variable (P/V), favourable or unfavourable (FAV / UNF).

Some manufacturers may require specific factors of safety to be applied to the stability of their cranes.

The loading on the tower crane base can be considered as follows:

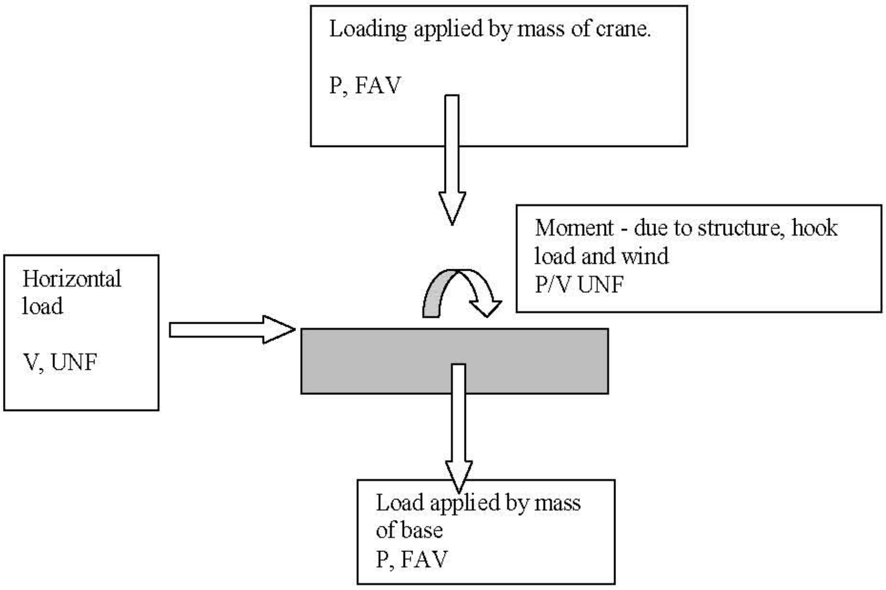


Figure A2.1 Loading applied to base by tower crane on cast-in anchors

Annex A2, BSEN 1997-1 recommends partial factors to be used in the calculation for the EQU limit state (overall stability). The factors are dependant on the type of loading applied - favourable, unfavourable, variable or permanent as shown in table A2.1.

Table A2.1 EQU limit state applied to stability of tower crane gravity base

Action	Partial factor recommended	Tower crane base application	
		Moment, vertical and horizontal loads specified	All load components specified
Permanent Favourable	0.9	Vertical (W_T)	Weight of crane and base
Permanent Unfavourable	1.1	Moment, horizontal (M_A, H)	Moment caused by crane weight and wind, horizontal wind load
Variable	0	Vertical	Actions caused by weights

Favourable			
Variable Unfavourable	1.5	Moment, horizontal	Actions caused by winds

The stability calculation requires that the factored overturning moment due to the design actions (Mo) is less than the factored restoring moment (Ms):

$M_o x1.5 \leq M_s$ x 0.9

i.e. $M_s \geq 1.67\, M_o$

where the base is a square of side length L and depth D.

When the partial factors associated with the effect of each action are combined (and neglecting the effect of any soil interaction in the stability) the minimum overall factor recommended is 1.67 (1.5 ÷0.9). Where all load components are specified separately, it should be possible to separate the variable and permanent elements of the unfavourable action and apply partial factors accordingly. In these cases the overall factor may be slightly lower than 1.67.

Where a piled bases is used, the stability check requires a split of loads depending on whether the pile is in tension or compression.

Table A2.2 Foundations for tower cranes on piled bases: values of partial factors for stability check.

	Vertical load	Moment and horizontal load
For max pile load (o-o-s)	Permanent unfavourable 1.1	Variable unfavourable 1.5
Min pile load (o-o-s)	Permanent favourable 0.9	Variable unfavourable 1.5

Geotechnical capacity

In a traditional design, this would involve comparison of the calculated maximum stresses with allowable stress determined either from the SI or from BS 8004. In some cases the allowable stress may have been calculated from the ultimate bearing capacity with a large factor of safety applied to restrict settlements. In this guide, two approaches are described:

- An allowable stress method in which the calculated soil stresses are compared with allowable bearing capacity provided by either the SI report or from BS 8004.
- Design by calculation, in accordance with BSEN1997-1, in which both soil resistance and loads are factored by partial factors. The section on BSEN 1997-1 compliant design indicates the minimum partial factors to be used.

Where design is carried out using an allowable bearing capacity approach, a factor of safety of 3 should provide the required margin against both ultimate and serviceability failure.

The possibility of an increase in water level may need to be considered. This would reduce geotechnical capacity as well as require the use of a submerged density of concrete in the stability calculation.

The design of piles for piled bases is often carried out by the piling contractor, who is supplied with the required working loads in tension and compression. It is recommended that the pile designer is instructed to ensure a minimum factor of safety of 2.5 for working compression loads compared with ultimate capacity. Where a pile test close to the location of the tower crane is available, the factor required for compressive capacity may be reduced to 2. A factor of 3 for the tensile capacity should apply in all cases. Tension piles will always require reinforcement that must be fully tied into the pile cap.

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POTAIN

3-Base reactions / Calculation / Tables reading

3-6 Reactions: safety coefficients

- Safety coefficients to apply to reactions
  Standard usage with chassis or standard blocks

Important! The reactions indicated on the tables are not magnified. They do not take into account the dynamic effect nor safety partial coefficient.

A global magnification coefficient :

1.5 for reactions in service

1.35 for reactions out of service

… Leads us to an envelope dimensioning from approximately +5% up to +20%, when compared to a composition calculated according to FEM1.001 or Eurocode EN1991-3

PREPARATION OF THE JOB SITE

INTRODUCTION

The responsability for the preparation of the crane job site rests entirely with the crane user. Any clearing, leveling, building up or reinforcing of the ground where the crane will be positioned and operated shall be carried out by him, as well as the verification of feasibility of the different crane installations proposed by the manufacturer.

CHECKING THE GROUND CONSISTENCY

The primary requirements to be met at the job site before the arrival of the crane are: concrete foundations, ground beneath the ballast placed under the undercarriage or rail tracks, depending on the crane configuration chosen.

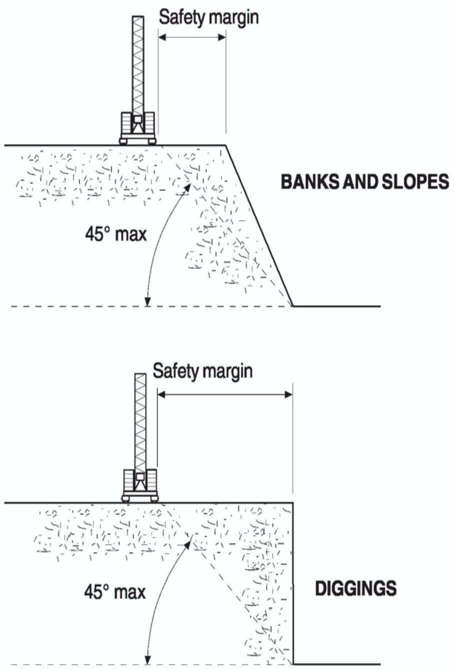
The installation of such elements depends particularly on the type of ground and foundation on which these assemblies are to be placed, as well as on the crane own characteristics.

The Buyer therefore must carry out a careful inspection and analysis of the ground consistency on which the crane shall stand.

Attention: *When close to diggings, slopes, banks, etc., keep such a safety margin as to grant a load distribution angle of 45°.*

The safety distance depends also on the ground characteristics (water quantity, friction, etc.).

Should ground conditions be critical, provide against sinkings with a containment concrete wall (picture 1.2.1).



Picture 1.2.1

Manitowoc Crane Care

Manitowoc Crane Group Middle East (FZE)

☒ Information Only
☐ Product Update – Non-Warranty
☐ Product Update – Warranty
☐ Action Required

ME08101

Subject: Safety Advice, Out of Service.

Model/s Affected: All tower cranes

Dear All,

We would like to remind you of some of the basic rules of safety concerning the use of towers cranes in windy conditions.

It is **strictly forbidden** to work with a speed wind greater than 72 km/h. At this speed and above, tower cranes must be rendered Out of Service. The effects of gusting wind must also be considered.

Out of Service implies (as a minimum):

- Crane does not have any load or slings on the hook.
- The hook must be fully raised and the trolley fully retracted.
- The jib must be positioned in the wind direction. It is imperative that the crane operator put the crane in weathervaning mode. The slewing brake must be free and the entire slewing structure must be able to turn freely through 360° (no buildings or other obstructions).
- Note that for luffing-jib cranes it is imperative to put the jib at the correct angle indicated on the catalogue. If this is not the case, weathervaning is impossible and will be ineffective.
- In cases of cranes on a travelling undercarriage, we remind you that the rail clamps must be tightened when the crane is out of service. The rails must be equipped with travelling limit switches, spring buffers and fixed bumpers (design dependent on crane specifications).
- Positioning of advertising/logo plates on jib and counter jib exceeding the manufacturer authorized surface area is not permitted. (In certain cases, it can be studied case by case by MCG/Potain but is ALWAYS subject to our approval).

06D - STORM WIND SPEED - OUT OF SERVICE

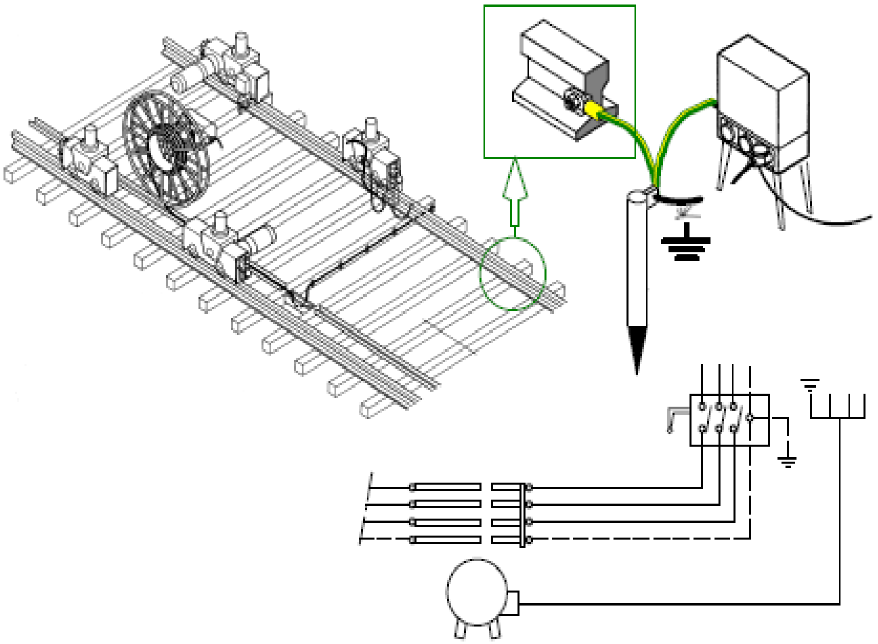
1. GENERAL NOTES

The storm wind reference speeds are determined according to the FEM 1.004 / Edition 07/2000 standard.

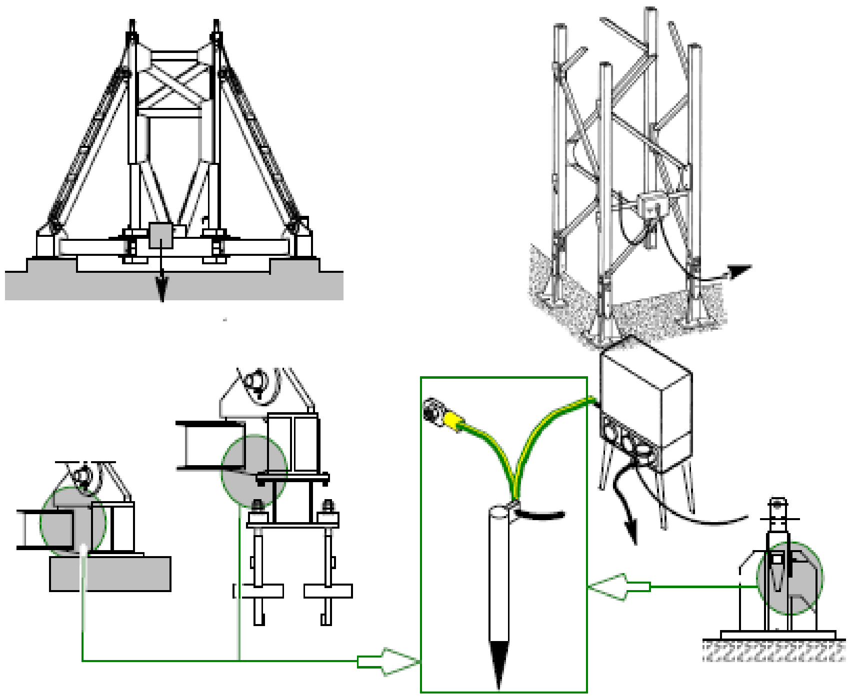
2. SPEED TABLE

	Wind speed	Dynamic pressure
Height 0 - 20 m above the ground	130 km/h (36 m/s)	800 N/m^2
Height 20 - 100 m above the ground	150 km/h (42 m/s)	1 100 N/m^2
Height higher than 100 m above the ground	165 km/h (46 m/s)	1 300 N/m^2

Rail-mounted crane



Static crane



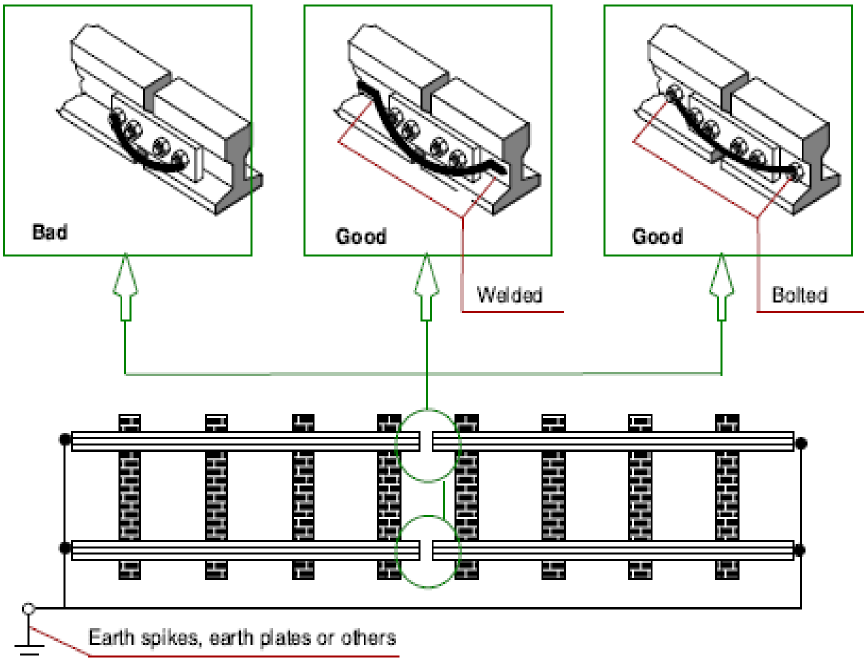
Earthing the track

The rails must be linked electrically in order to short-circuit the electric resistance due to the mechanical rail joints. Consequently, the electrical connection is never fixed at the bolts of the mechanical rail connections. It must be carried out:

- either by ground cables or copper braidings with a minimum section of 28 mm, bolted or soldered to the rails,
- or by iron conductors with a minimum section of 50 mm, welded to the rails.

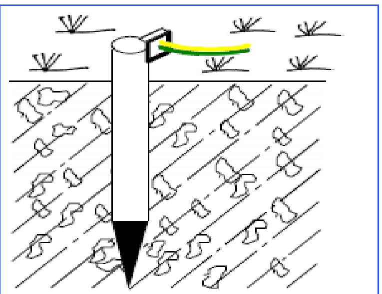
All the earth or fishplate conductors which are to be bolted, must be equipped with soldering terminals or cable clamping ends.

The conductor, linking the rails to the earth connection, must have a section, depending on its type, which is at least equal to that of the fishplate conductor.



Various types of earth connection

To be prepared by the customer by means of:

Earth spike (type according to electrical rules) or steel tube 33 x 45 of 1,5 to 2 m length	
Earth plates made up of sheet or expanded metal of 1 m^2 buried vertically,