



RR ANCHOR SYSTEM

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RR ANCHOR SYSTEM

1. General Instructions

Peikko RR-anchors are a component of the Peikko transport anchor system. They are available in blank, galvanised or hot-dip galvanised types. According to the envisaged application they can be bought in different lengths and types. Peikko RR-anchors correspond to the safety regulations of the Trade Association "Safety Regulations for Transport Anchors and Transport Systems of Concrete Finished Parts" (Sicherheitsregeln für Transportanker und -systeme von Betonfertigteilen) (BGR 106).

Abiding by these instructions for installation and use of RR anchors and RR couplings and by the general instructions for the installation and application is a pre-condition for the application of Peikko RR-anchors. It is only allowed to use Peikko RR-anchors in connection with original Peikko lifting devices. Welding on the anchors is not allowed.

Peikko RR-anchors are developed for the transport of concrete pre-cast parts. Within the transport chain, from the production up to the final assembly of the finished part, multiple contacts with other building components is not considered as a repeated application. More repeated applications (e.g. crane ballast or dam beam fasteners) are only allowed, if they comply with the Acceptance Letter „products, connecting means and components made of stainless steels“ (Erzeugnisse, Verbindungsmittel und Bauteile aus nichtrostenden Stählen)(DIBT Berlin, Zul. No. Z-30.3-6).

For unequivocal differentiation between the different sizes Peikko RR-anchors bear a marking that identifies the manufacturer and the load category. Therefore, a correct and unambiguous allocation of the Peikko RR-coupling is guaranteed.

The Peikko RR-anchor-system consists of the transport anchor, which is embedded in the concrete part, and the matching Peikko RR-coupling. For the different uses RR-anchors with different load-carrying capacity are available. Those load-carrying capacities are divided into four load groups (see Table 1). For every load group there is a suitable Peikko RR-connection. The design makes a wrong allocation impossible.

Load Group Peikko RR-coupling	Load Category Peikko RR-anchor
2,5 t.	0,7 t.
	1,4 t.
	2,5 t.
5,0 t.	3,0 t.
	4,0 t.
	5,0 t.
10,0 t.	7,5 t.
	10,0 t.
26,0 t.	12,5 t.
	14,0 t.
	17,0 t.
	22,0 t.
	26,0 t.

Table 1: Allocation of the load groups

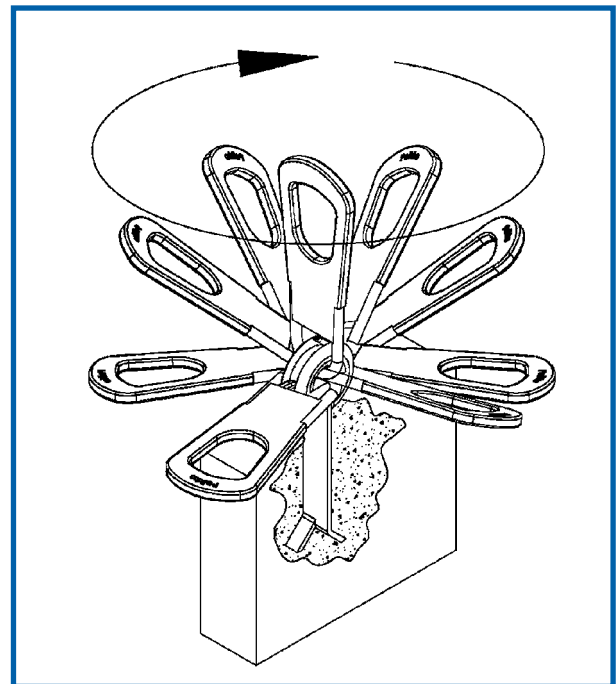


Fig. 1

2. Load Direction and Anchor Arrangement

2.1 Load directions






Load directions	Symbol
Centrically tensile load in direction of the anchor axis	
Transverse pull normal to the flat steel	
Transverse pull parallel to the flat steel	
Oblique tension with lateral force normal to the flat steel	
Oblique tension with lateral force parallel to the flat steel	

Table 2: Symbols of load direction

2.2 Arrangement of the anchors

2.2.1 Thin-walled concrete elements

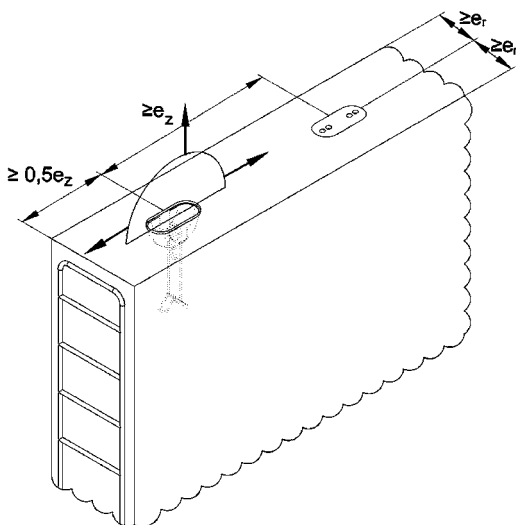


Fig. 2

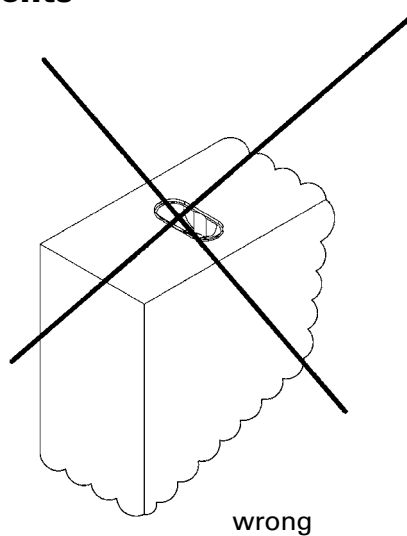


Fig. 3

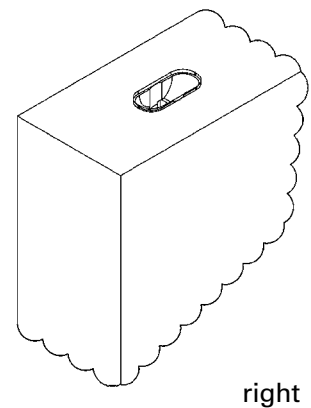


Fig. 4

In thin-walled concrete elements the RR-anchors may only be installed rectangular to the plane of the structural element (see Figs. 3 and 4). Other arrangements affect the function and the load-carrying capacity of the anchor.

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2.2.2 Large-sized concrete elements

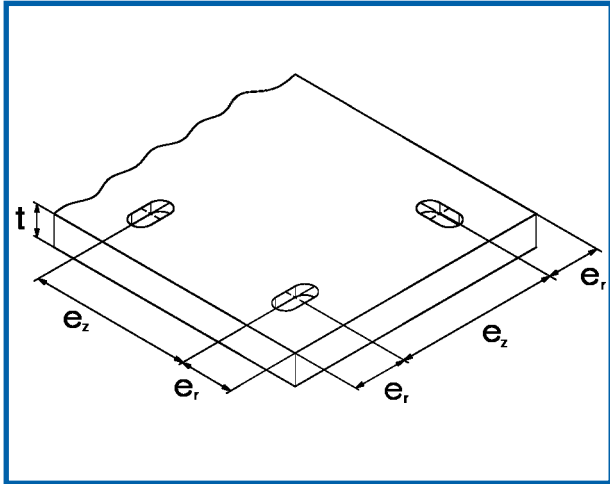


Fig. 5

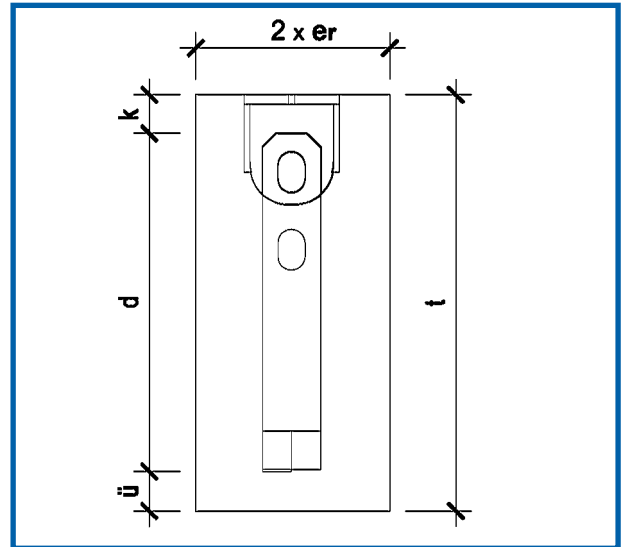


Fig. 6

Minimum component thickness for precast concrete components:

$$t = d + k + \ddot{u}$$

d = Length of the anchor

k = Overlap of the anchor head

\ddot{u} = Concrete coverage according to DIN 1045-1

3. Peikko RR Anchors

3.1. Dimensions of Peikko RR-SA spread anchors

Because of its additional oblong hole the RR-SA anchor is of multiple applications. Optimum anchorages are possible for thin-walled precast components as well as for large-sized components. In special cases the anchor can also be used as a hole anchor.

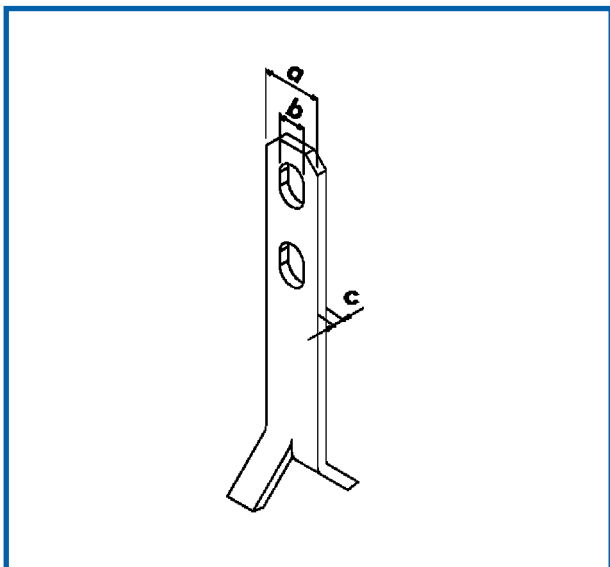


Fig. 7

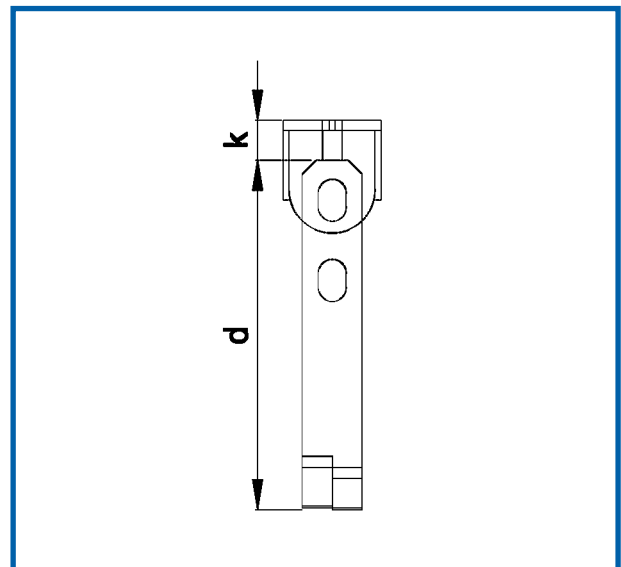


Fig. 8

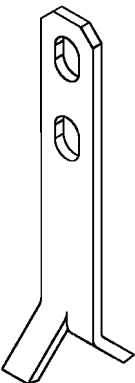
RR spread anchors	Load group	Load category	Designation	Article No.	Length d [mm]	Width a [mm]	Hole b [mm]	Thickness c [mm]	Installation depth k [mm]	Weight [kg]
	2,5	0,7	RR-SA-0,7-110	16700010	110	30	14	5	10	0,120
		1,4	RR-SA-1,4-110	16700020	110	30	14	6	10	0,140
			RR-SA-1,4-160	16700030	160	30	14	6	10	0,210
		2,5	RR-SA-2,5-150	16700071	150	30	14	10	10	0,300
			RR-SA-2,5-200	16700080	200	30	14	10	10	0,440
			RR-SA-2,5-250	16700090	250	30	14	10	10	0,550
	5,0	3,0	RR-SA-3,0-160	16700100	160	40	18	10	10	0,450
			RR-SA-3,0-200	16700110	200	40	18	10	10	0,580
			RR-SA-3,0-280	16700120	280	40	18	10	10	0,840
		4,0	RR-SA-4,0-180	16700130	180	40	18	12	10	0,620
			RR-SA-4,0-240	16700140	240	40	18	12	10	0,840
			RR-SA-4,0-320	16700150	320	40	18	12	10	1,160
		5,0	RR-SA-5,0-180	16700160	180	40	18	15	10	0,780
			RR-SA-5,0-240	16700170	240	40	18	15	10	1,050
			RR-SA-5,0-400	16700180	400	40	18	15	10	1,780
	10,0	7,5	RR-SA-7,5-260	16700190	260	60	26	16	15	1,800
			RR-SA-7,5-300	16700200	300	60	26	16	15	2,110
			RR-SA-7,5-420	16700210	420	60	26	16	15	3,010
		10,0	RR-SA-10,0-300	16700220	300	60	26	20	15	2,640
			RR-SA-10,0-370	16700230	370	60	26	20	15	3,260
			RR-SA-10,0-520	16700240	520	60	26	20	15	4,690
	26,0	14,0	RR-SA-14,0-370	16700250	370	80	35	20	15	3,950
			RR-SA-14,0-460	16700260	460	80	35	20	15	5,330
		22,0	RR-SA-22,0-500	16700270	500	90	35	28	15	7,590
			RR-SA-22,0-620	16700280	620	90	35	28	15	9,580

Table 3: Dimensions of RR spread anchors. Other lengths on inquiry.

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3.1.1. Distances and allowed loads for large-sized and thick-walled elements for RR-SA anchors

Load category	Designation	Article No.	Length d [mm]	Load-carrying capacity F_{allowed} [kN]	Girder depth $d_1^{(a)}$ [mm]	Minimum edge distance of the beams e_r			Minimum slab depth $d_2^{(b)}$ [mm]	Minimum edge distance of the slabs e_r			Minimum centre distance for beams and slabs e_z [mm]
						$\beta_w \geq 15$ N/mm ²	$\beta_w \geq 25$ N/mm ²	$\beta_w \geq 35$ N/mm ²		$\beta_w \geq 15$ N/mm ²	$\beta_w \geq 25$ N/mm ²	$\beta_w \geq 35$ N/mm ²	
0,7	RR-SA-0,7-110	16700010	110	7	200	35	35	35	145	35	35	35	280
1,4	RR-SA-1,4-110	16700020	110	14	190	55	40	35	145	70	50	40	380
	RR-SA-1,4-160	16700030	160	14	290	35	35	35	195	50	35	35	530
2,5	RR-SA-2,5-150	16700071	150	25	260	90	65	50	185	120	85	70	520
	RR-SA-2,5-200	16700080	200	25	360	65	45	35	235	90	65	50	720
	RR-SA-2,5-250	16700090	250	25	460	50	35	35	285	75	50	40	920
3,0	RR-SA-3,0-160	16700100	160	30	275	105	75	60	195	145	100	80	550
	RR-SA-3,0-200	16700110	200	30	350	80	60	45	235	115	85	65	710
	RR-SA-3,0-280	16700120	280	30	510	55	40	40	315	85	60	50	1025
4,0	RR-SA-4,0-180	16700130	180	40	310	140	100	80	215	190	135	105	610
	RR-SA-4,0-240	16700140	240	40	425	100	70	55	275	145	100	80	850
	RR-SA-4,0-320	16700150	320	40	590	70	50	40	355	110	75	60	1175
5,0	RR-SA-5,0-180	16700160	180	50	300	190	135	110	215	260	180	145	600
	RR-SA-5,0-240	16700170	240	50	420	135	95	75	275	195	140	110	840
	RR-SA-5,0-400	16700180	400	50	740	75	55	45	435	115	85	65	1480
7,5	RR-SA-7,5-260	16700190	260	75	450	210	150	120	300	300	215	175	900
	RR-SA-7,5-300	16700200	300	75	530	180	125	100	340	265	190	150	1060
	RR-SA-7,5-420	16700210	420	75	770	120	85	70	460	190	135	110	1540
10,0	RR-SA-10,0-300	16700220	300	100	515	270	190	150	340	390	275	220	1030
	RR-SA-10,0-370	16700230	370	100	655	210	150	120	410	315	225	180	1310
	RR-SA-10,0-520	16700240	520	100	955	140	100	80	560	225	160	130	1910
14,0	RR-SA-14,0-370	16700250	370	140	615	350	250	200	410	500	355	285	1230
	RR-SA-14,0-460	16700260	460	140	795	265	190	150	500	400	285	230	1590
22,0	RR-SA-22,0-500	16700270	500	220	850	450	320	260	540	675	480	385	1700
	RR-SA-22,0-620	16700280	620	220	1090	350	250	200	660	540	385	310	2180

Table 4: Allowed distances and loads for large-sized and thick-walled elements

- Reinforcement requirement: constructional minimum reinforcement
- ^(a) Linear interpolation is possible between the minimum girder depth d_1 and the minimum slab depth d_2 .
- ^(b) The minimum depth of cover at the base is ≥ 25 mm. In case of special corrosion protection it is possible to use thinner slabs.
- For Transport the upper reinforcement has to be calculated

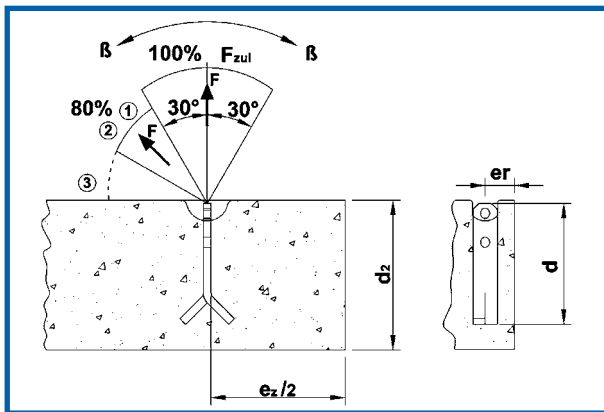


Fig. 9

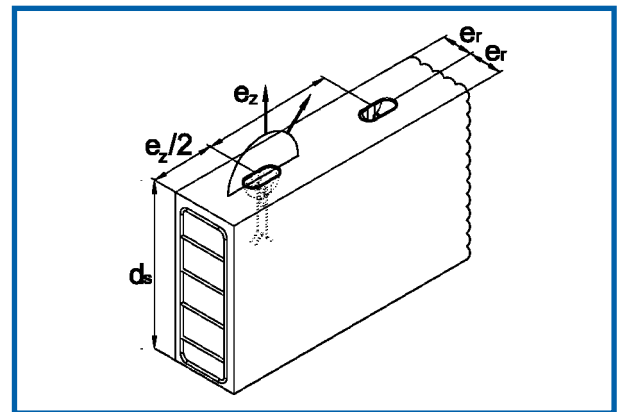


Fig. 10

- ① Oblique tension with $30^\circ < \beta \leq 60^\circ$ without oblique tension reinforcement is only permissible at:
 $\beta_w \geq 15 \text{ N/mm}^2$ and 3 x the minimum thickness of the structural element
 $\beta_w \geq 25 \text{ N/mm}^2$ and 2.5 x the minimum thickness of the structural element
 $\beta_w \geq 35 \text{ N/mm}^2$ and 2 x the minimum thickness of the structural element
- ② In case of using a concrete strength $\beta_w \geq 23 \text{ N/mm}^2$ it is possible to make $F_{\text{allowed}} = 100\%$
- ③ An angle $\beta > 60^\circ$ is not allowed!

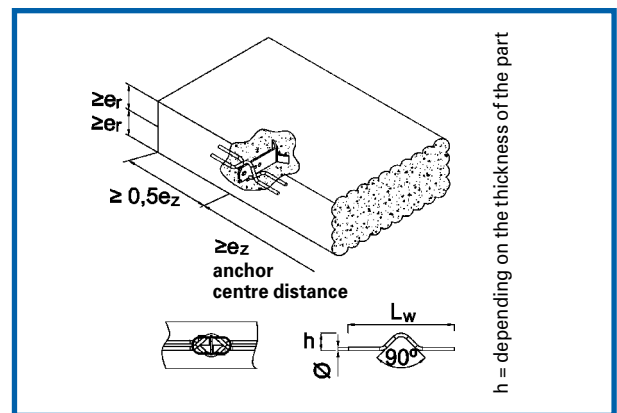


Fig. 11 Bending radii according to DIN 1045-1

3.1.2. Centre distances and edge distances, allowed loads for RR-SA anchors used for putting up and turning

The horizontal legs of the putting up and turning reinforcement are positioned directly within the outer layer of the surface reinforcement.

Load category	Designation	Article No.	Length d [mm]	Minimum edge distance and minimum centre distance for $\beta_w \geq 15 \text{ N/mm}^2$		Turning and putting up reinforcement for		Permitted loads for $\beta_w \geq 15 \text{ N/mm}^2$		
				e_r [mm]	e_z [mm]	ϕ [mm]	L_w expanded length [mm]	Transport [kN]	Transport*) [kN]	Mounting [kN]
0,7	RR-SA-0,7-110	16700010	110	100	700	8	600	7	5,6	3,5
1,4	RR-SA-1,4-160	16700030	160	100	700	10	700	14	11,2	7
2,5	RR-SA-2,5-250	16700090	250	100	875	12	800	25	20,0	12,5
3,0	RR-SA-3,0-280	16700120	280	150	950	12	850	30	24,0	15
4,0	RR-SA-4,0-320	16700150	320	150	1050	14	950	40	32,0	20
5,0	RR-SA-5,0-400	16700180	400	150	1435	16	1000	50	40,0	25
7,5	RR-SA-7,5-420	16700210	420	250	1470	20	1200	75	60,0	37,5
10,0	RR-SA-10,0-520	16700240	520	300	1820	20	1500	100	80,0	50
14,0	RR-SA-14,0-460	16700260	460	525	1800	25	1800	140	112,0	70
22,0	RR-SA-22,0-620	16700280	620	710	2200	28	1800	220	176,0	110

Table 5: Centre distances and edge distances, permitted loads for putting up and turning at $\beta_w \geq 15 \text{ N/mm}^2$

Requirement on the reinforcement: Constructional minimum reinforcement

*) In this loading case at $\beta_w \geq 23 \text{ N/mm}^2$ 100% of the load is permitted.

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3.1.3. Distances and allowed loads for RR-SA anchors used for thin-walled elements

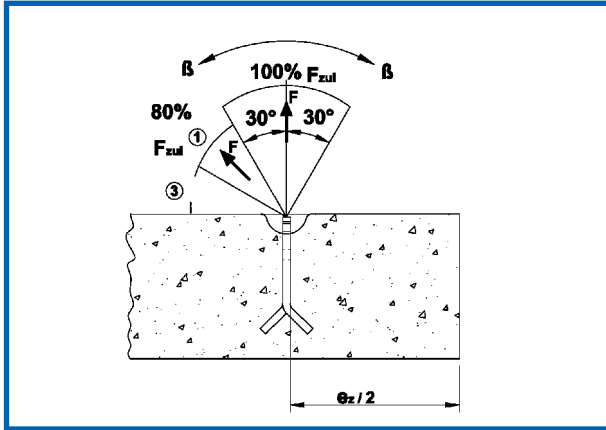


Fig. 12

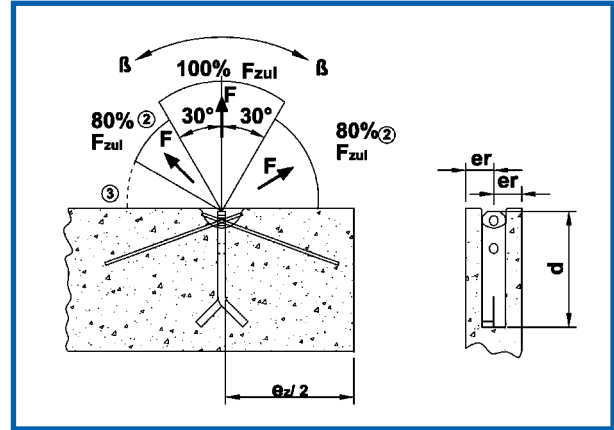


Fig. 13

The oblique tension reinforcement should be placed as near as possible to the recess-forming cup.

- ① Oblique tension with $30^\circ < \beta \leq 60^\circ$ without oblique tension reinforcement is only permitted when
 - $\beta_w \geq 15 \text{ N/mm}^2$ and 3 x the minimum thickness of the structural element
 - $\beta_w \geq 25 \text{ N/mm}^2$ and 2.5 x the minimum thickness of the structural element
 - $\beta_w \geq 35 \text{ N/mm}^2$ and 2 x the minimum thickness of the structural element
- ② In case of using a concrete strength $\beta_w \geq 23 \text{ N/mm}^2$ it is possible to make $F_{\text{allowed}} = 100\%$
- ③ An angle $\beta > 60^\circ$ is not allowed!

Load category	Designation	Article No.	Length d [mm]	Centre distance for $e_z \geq$ [mm]	Minimum thickness of building component $2 \times e_r$			100% $F_{\text{permitted}}$ tension $\beta \leq 30^\circ$ [kN]	80% $F_{\text{permitted}}$ oblique tension $\beta > 30^\circ$ [kN]
					$\beta_w \geq 15 \text{ N/mm}^2$ [mm]	$\beta_w \geq 25 \text{ N/mm}^2$ [mm]	$\beta_w \geq 35 \text{ N/mm}^2$ [mm]		
0,7	RR-SA-0,7-110	16700010	110	330	60	60	60	7	5,6
1,4	RR-SA-1,4-110	16700020	110	330	75	60	60	14	11,2
	RR-SA-1,4-160	16700030	160	480	75	60	60	14	11,2
2,5	RR-SA-2,5-150	16700071	150	450	120	90	80	25	20
	RR-SA-2,5-200	16700080	200	600	120	90	80	25	20
	RR-SA-2,5-250	16700090	250	750	120	90	80	25	20
3,0	RR-SA-3,0-160	16700100	160	480	160	90	80	30	24
	RR-SA-3,0-200	16700110	200	600	120	90	80	30	24
	RR-SA-3,0-280	16700120	280	840	120	90	80	30	24
4,0	RR-SA-4,0-180	16700130	180	540	210	130	100	40	32
	RR-SA-4,0-240	16700140	240	720	150	115	100	40	32
	RR-SA-4,0-320	16700150	320	960	150	115	100	40	32
5,0	RR-SA-5,0-180	16700160	180	540	350	210	150	50	40

Load category	Designation	Article No.	Length d [mm]	Centre distance for $e_z \geq$ [mm]	Minimum thickness of building component $2 \times e_r$			100% $F_{\text{permitted tension}} \beta \leq 30^\circ$ [kN]	80% $F_{\text{permitted oblique tension}} \beta > 30^\circ$ [kN]
					$\beta_w \geq 15 \text{ N/mm}^2$ [mm]	$\beta_w \geq 25 \text{ N/mm}^2$ [mm]	$\beta_w \geq 35 \text{ N/mm}^2$ [mm]		
5,0	RR-SA-5,0-240	16700170	240	720	180	140	120	50	40
	RR-SA-5,0-400	16700180	400	1200	180	140	120	50	40
7,0	RR-SA-7,5-260	16700190	260	780	340	200	150	75	60
	RR-SA-7,5-300	16700200	300	900	240	150	130	75	60
	RR-SA-7,5-420	16700210	420	1260	195	150	130	75	60
10,0	RR-SA-10,0-300	16700220	300	900	450	270	190	100	80
	RR-SA-10,0-370	16700230	370	1110	270	190	160	100	80
	RR-SA-10,0-520	16700240	520	1560	245	190	160	100	80
14,0	RR-SA-14,0-370	16700250	370	1110	610	360	260	140	112
	RR-SA-14,0-460	16700260	460	1380	350	210	165	140	112
22,0	RR-SA-22,0-500	16700270	500	1500	760	460	330	220	176
	RR-SA-22,0-620	16700280	620	1860	450	270	230	220	176

Table 6: Distances and allowed loads for thin-walled elements. The arrangement of the reinforcement according to Table 7 is to be considered to achieve the above listed values.

3.1.4. Reinforcement in the anchor area of thin-walled elements for RR-SA anchors

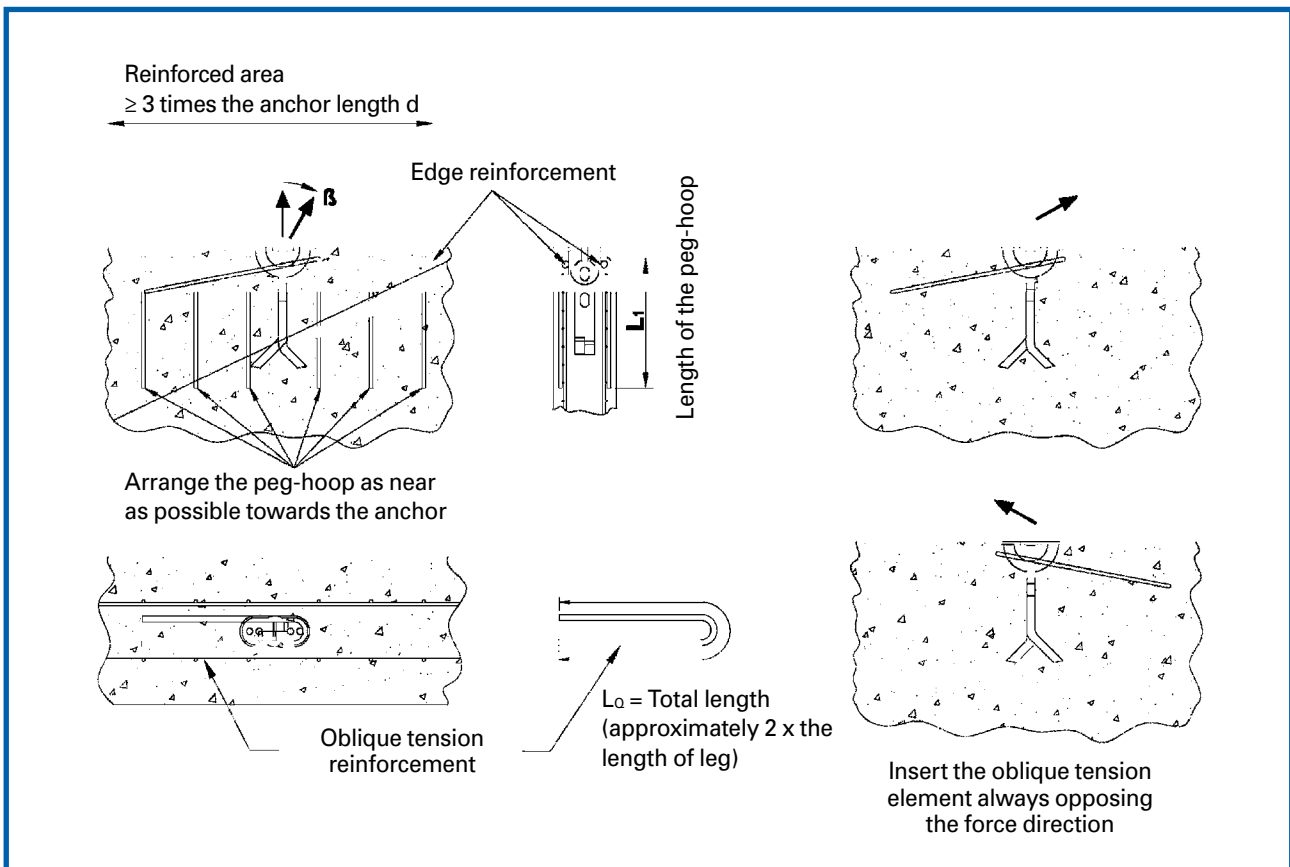


Fig. 14

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Load group	Load category	Tension $\beta \leq 30^\circ$			Tension $\beta > 30^\circ$			
		Crosswise reinforcement on both sides [mm ² /m]	Peg-hoop BSt500S quantity $n \times L_1$ [mm]	Edge reinforcement BSt500S [mm]	Crosswise reinforcement both sided [mm]	Peg-hoop BSt500S quantity $n \times L_1$ [mm]	Edge reinforcement BSt500S [mm]	Oblique tension reinforcement**) BSt500S quantity $n \times L_0$ [mm]
2,5	0,7	131	structural	structural	131	4x Ø6 x 300	Ø8	Ø6 x 450
	1,4	131	2x Ø6 x 400	structural	131	4x Ø6 x 400	Ø8	Ø6 x 900
	2,5	131	2x Ø8 x 600	structural	131	4x Ø8 x 600	Ø10	Ø8 x 1200
5,0	3,0	131	2x Ø8 x 700	structural	131	4x Ø8 x 700	Ø10	Ø10 x 1150
	4,0	131	2x Ø8 x 800	structural	131	4x Ø8 x 800	Ø12	Ø10 x 1500
	5,0	131	2x Ø10 x 800	structural	131	4x Ø10 x 800	Ø12	Ø12 x 1550
10,0	7,5	188	4x Ø10 x 800	Ø10	188	4x Ø10 x 800	Ø12	Ø14 x 2000
	10,0	188	6x Ø10 x 1000	Ø12	188	6x Ø10 x 1000	Ø14	Ø16 x 2300
26,0	14,0	257	6x Ø10 x 1000	Ø14	257	8x Ø10 x 1000	Ø14	Ø20 x 2600
	22,0	257	8x Ø10 x 1200	Ø14	257	8x Ø10 x 1200	Ø16	Ø28 x 3450

Table 7: Reinforcement in the anchor area using thin-walled elements

**) Oblique tension reinforcement is not necessary when

- concrete strength $\beta_w \geq 15$ N/mm² and 3 x the minimum thickness of the structural element
- concrete strength $\beta_w \geq 25$ N/mm² and 2.5 x the minimum thickness of the structural element
- concrete strength $\beta_w \geq 35$ N/mm² and 2 x the minimum thickness of the structural element

3.2. Dimensions of Peikko RR-HA anchors

The RR-HA geometry corresponds to the RR-SA anchor in the head region. As opposed to the RR-SA, there is no expanding in the foot region, but only a punching to receive the extra reinforcement. Therefore the anchorage is provided only through the extra reinforcement.

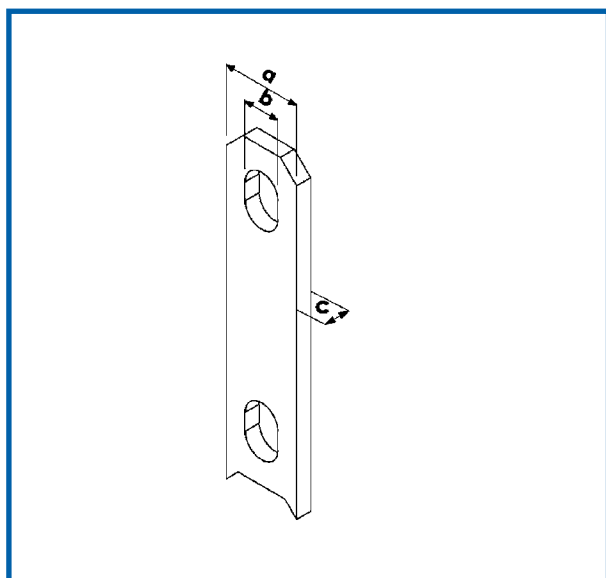


Fig. 15

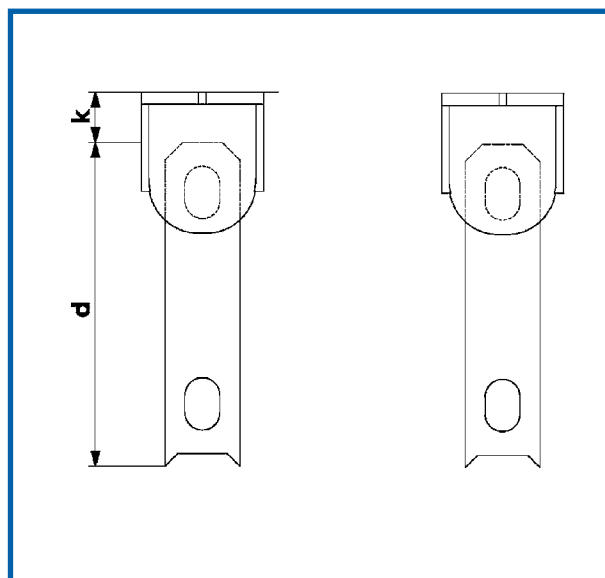


Fig. 16

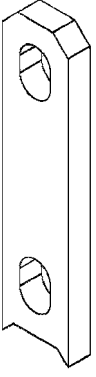
RR double hole anchor	Load group	Load category	Designation	Article No.	Length d [mm]	Width a [mm]	Hole b [mm]	Thickness c [mm]	Installation depth k [mm]	Weight [kg]
	2,5	1,4	RR-HA-1,4-90	16700010	90	30	14	6	10	0,09
		2,5	RR-HA-2,5-90	16700030	90	30	14	10	10	0,170
	5,0	3,0	RR-HA-3,0-120	16700040	120	40	18	10	10	0,300
		4,0	RR-HA-4,0-120	16700050	120	40	18	12	10	0,370
		5,0	RR-HA-5,0-120	16700060	120	40	18	15	10	0,450
	10,0	7,5	RR-HA-7,5-160	16700070	160	60	26	16	15	0,960
		10,0	RR-HA-10,0-170	16700080	170	60	30	20	15	1,190
	26,6	14,0	RR-HA-14,0-240	16700090	240	80	35	20	15	2,560
		22,0	RR-HA-22,0-300	16700100	300	90	35	28	15	4,080
		26,0	RR-HA-26,0-300	16700110	300	120	65	30	15	7,200

Table 8: Dimensions of the two-hole anchor

3.2.1. Distances and allowed loads for RR-HA anchors

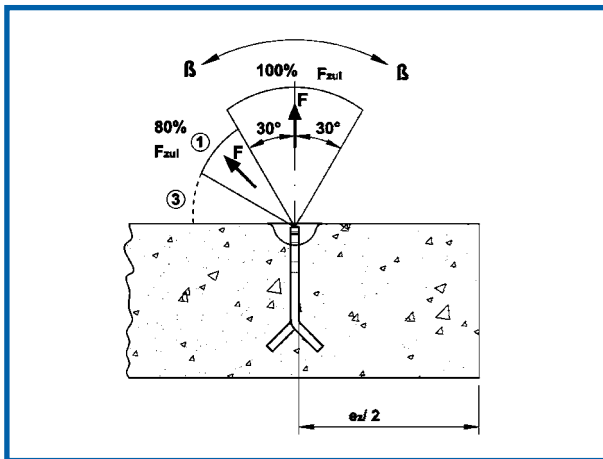


Fig. 17

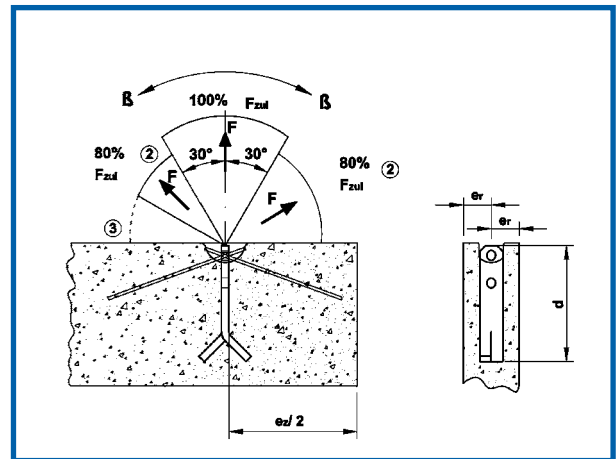


Fig. 18

The oblique tension reinforcement should be positioned as near as possible to the recess-forming cup.

- ① Oblique tension with $30^\circ < \beta \leq 60^\circ$ without oblique tension reinforcement is only permitted when
 - $\beta_w \geq 15 \text{ N/mm}^2$ and 3 x the minimum thickness of the structural element
 - $\beta_w \geq 25 \text{ N/mm}^2$ and 2.5 x the minimum thickness of the structural element
 - $\beta_w \geq 35 \text{ N/mm}^2$ and 2 x the minimum thickness of the structural element
- ② In case of using a concrete strength $\beta_w \geq 23 \text{ N/mm}^2$ it is possible to make $F_{\text{allowed}} = 100\%$
- ③ An angle $\beta > 60^\circ$ is not allowed!

RR ANCHOR SYSTEM

Load group	Load category	Designation	Article No.	Length d [mm]	Centre distance for $e_z \geq$ [mm]	Minimum thickness of the building component $2 \times e_r$ [mm]	100% $F_{\text{permitted tension}} \beta \leq 30^\circ$ [kN]	80% $F_{\text{permitted oblique tension}} \beta > 30^\circ$ [kN]
2,5	1,4	RR-HA-1,4-90	16700010	90	500	80	14	11,2
	2,5	RR-HA-2,5-90	16700030	90	600	100	25	20
5,0	3,0	RR-HA-3,0-120	16700040	120	650	100	30	24
	4,0	RR-HA-4,0-120	16700050	120	700	110	40	32
	5,0	RR-HA-5,0-120	16700060	120	750	120	50	40
10,0	7,5	RR-HA-7,5-160	16700070	160	1200	130	75	60
	10,0	RR-HA-10,0-170	16700080	170	1200	140	100	80
26,6	14,0	RR-HA-14,0-240	16700090	240	1500	160	140	112
	22,0	RR-HA-22,0-300	16700100	300	1500	180	220	176
	26,0	RR-HA-26,0-300	16700110	300	1500	200	260	208

Table 9: Centre distances, permitted loads at $\beta_w \geq 15 \text{ N/mm}^2$

3.2.2. Reinforcement in the anchor area of RR-HA anchors

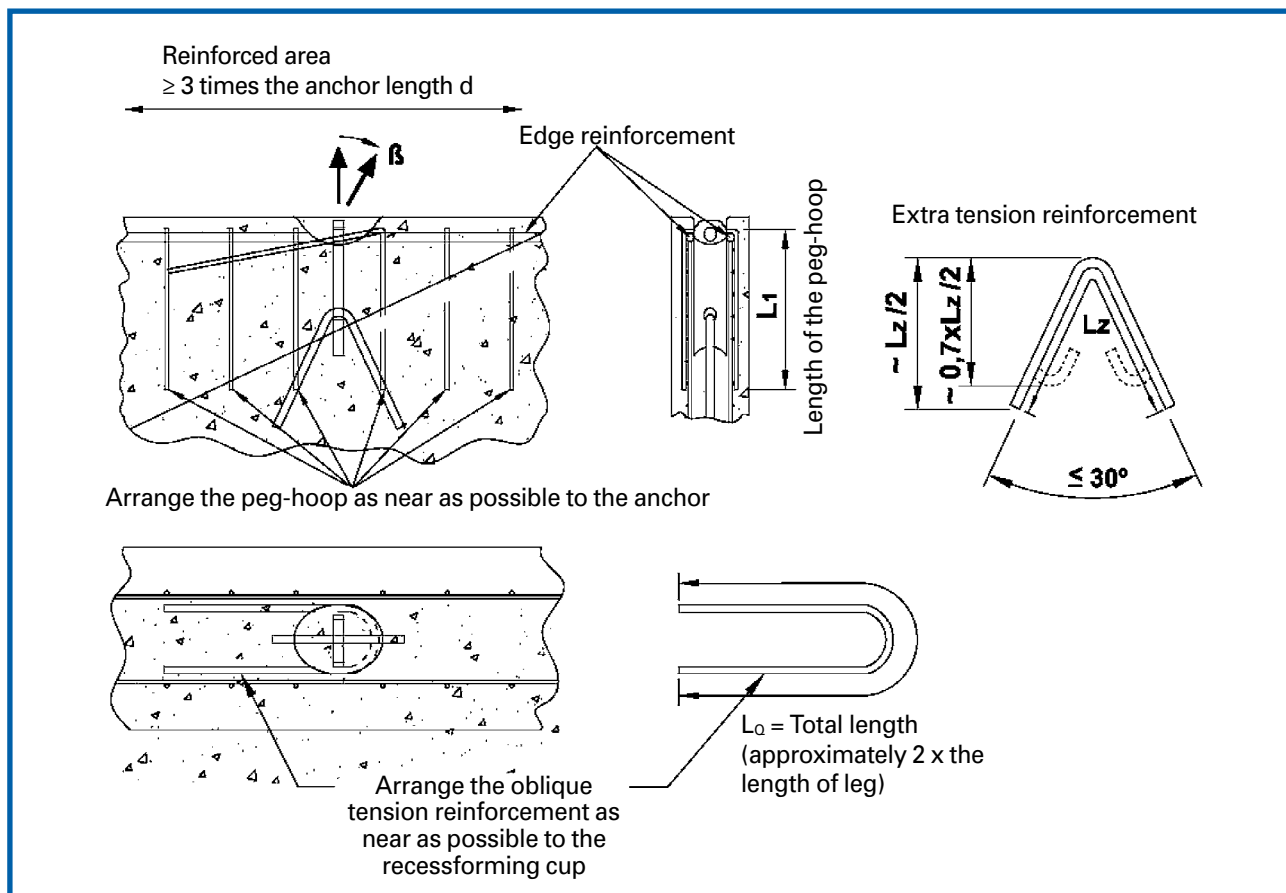


Fig. 19

Load category	Designation	Tension $\beta \leq 30^\circ$				Oblique tension $\beta > 30^\circ$				
		Cross-wise reinforcement on both sides [mm ² /m]	Peg-hoop BS500S $d \times L_1$ [mm]	Edge reinforcement BS500S [mm]	Extra tension reinforcement BS500S both sided $d \times L_z$ [mm]	Cross-wise reinforcement both sided [mm ² /m]	Peg-hoop BS500S $d \times L_1$ [mm]	Edge reinforcement BS500S [mm]	Extra tension reinforcement BS500S both sided $d \times L_z$ [mm]	Oblique tension reinforcement**) BS500S quantity $n \times \phi \times L_\phi$ [mm]
1,4	RR-HA-1,4-90	131	2x $\phi 6 \times 400$	structural	1x $\phi 10 \times 650$	131	4x $\phi 6 \times 400$	$\phi 8$	1x $\phi 10 \times 650$	$\phi 6 \times 900$
2,5	RR-HA-2,5-90		2x $\phi 8 \times 600$		1x $\phi 12 \times 1000$		4x $\phi 8 \times 600$	$\phi 10$	1x $\phi 12 \times 1000$	$\phi 8 \times 1200$
3,0	RR-HA-3,0-120	131	2x $\phi 8 \times 700$		1x $\phi 14 \times 1000$	131	4x $\phi 8 \times 700$	$\phi 10$	1x $\phi 14 \times 1000$	$\phi 10 \times 1150$
4,0	RR-HA-4,0-120		2x $\phi 8 \times 700$		1x $\phi 16 \times 1200$		4x $\phi 8 \times 800$	$\phi 12$	1x $\phi 16 \times 1200$	$\phi 10 \times 1500$
5,0	RR-HA-5,0-120		2x $\phi 8 \times 800$		1x $\phi 16 \times 1500$		4x $\phi 10 \times 800$	$\phi 12$	1x $\phi 16 \times 1500$	$\phi 12 \times 1550$
7,5	RR-HA-7,5-160	131	2x $\phi 10 \times 800$	$\phi 10$	1x $\phi 20 \times 1750$	131	4x $\phi 10 \times 800$	$\phi 12$	1x $\phi 20 \times 1750$	$\phi 14 \times 2000$
10,0	RR-HA-10,0-170		4x $\phi 10 \times 800$	$\phi 12$	1x $\phi 25 \times 1850$		6x $\phi 10 \times 1000$	$\phi 14$	1x $\phi 25 \times 1850$	$\phi 16 \times 2300$
14,0	RR-HA-14,0-240	131	4x $\phi 10 \times 1000$	$\phi 14$	1x $\phi 28 \times 2350$	131	8x $\phi 10 \times 1000$	$\phi 14$	1x $\phi 28 \times 2350$	$\phi 20 \times 2600$
22,0	RR-HA-22,0-300		4x $\phi 12 \times 1200$		1x $\phi 28 \times 3000$		8x $\phi 10 \times 1200$	$\phi 16$	1x $\phi 28 \times 3000$	$\phi 25 \times 3000$
26,0	RR-HA-26,0-300		6x $\phi 12 \times 1200$		2x $\phi 28 \times 3050$		8x $\phi 12 \times 1200$	$\phi 16$	2x $\phi 28 \times 3050$	$\phi 28 \times 3450$

Table 10: Dimensions of the reinforcement

- ① No oblique tension reinforcement necessary when
 $\beta_w \geq 15 \text{ N/mm}^2$ and 3 x the minimum thickness of the structural element
 $\beta_w \geq 25 \text{ N/mm}^2$ and 2.5 x the minimum thickness of the structural element
 $\beta_w \geq 35 \text{ N/mm}^2$ and 2 x the minimum thickness of the structural element Minimum thickness is 2 x e_r

- ② With other concrete strengths it is allowed to reduce the length L_z of the extra tension reinforcement in proportion to the allowed bond stress
($\beta_w = 25 \text{ N/mm}^2$: x 0,8; $\beta_w = 35 \text{ N/mm}^2$: x 0,65).
With lower concrete strengths or lightweight concrete, please contact our technical department.

3.3. Dimensions of Peikko RR-EA erection anchors

3.3.1 Peikko RR-EA erection anchors both-sided (standard)

Because of its special construction form the RR-EA is very suitable for setting up precast concrete components. The lateral supports in the head of the anchor prevent the resulting forces from acting directly on the concrete while setting up. Instead, the loads are taken completely by the supports and therefore directly transferred to the anchor. Thus damages in the precast components are completely avoided. The semicircular notches in the longitudinal edges of the anchor are made to take the oblique tension reinforcement.

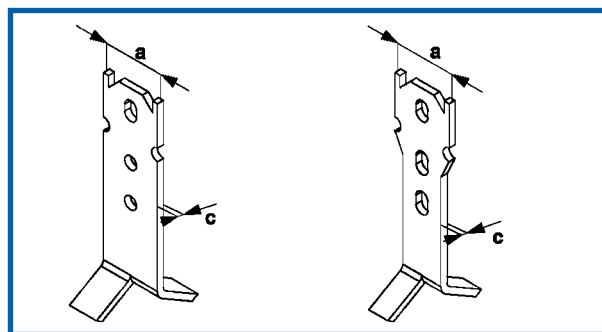


Fig. 20

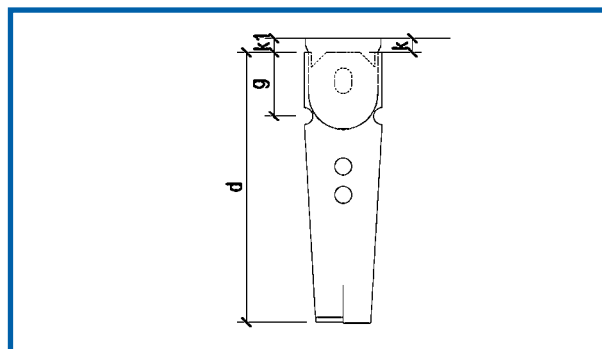


Fig. 21

RR ANCHOR SYSTEM

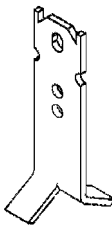
RR erection anchors both-sided	Load group	Load category	Designation	Article No.	Length d [mm]	Width a [mm]	Hole b [mm]	Thickness c [mm]	Length g [mm]	Installation depth k [mm]	Installation depth k1 [mm]	Weight [kg]
	2,5	1,4	RR-EA-1,4-200	16720010	200	55	14	6	45	10	5	0,37
		2,5	RR-EA-2,5-230	16720020	230	55	14	10	45	10	5	0,69
	5,0	4,0	RR-EA-4,0-270	16720040	270	70	18	12	70	10	5	1,30
		5,0	RR-EA-5,0-290	16720040	290	70	18	15	70	10	5	1,66
	10,0	7,5	RR-EA-7,5-320	16720050	320	95	26	15	90	15	6	2,42
		10,0	RR-EA-10,0-390	16720060	390	95	26	20	90	15	6	3,95
	26,0	12,5	RR-EA-12,5-500	16720070	500	148	35	20	90	15	9	6,64
		17,0	RR-EA-17,0-500	16720080	500	148	35	25	90	15	9	8,18
		22,0	RR-EA-22,0-500	16720090	500	148	65	30	90	15	9	9,84

Table 11: Dimensions of erection anchors both-sided

3.3.2. Peikko RR-EA-O erection anchors one-sided

Because of its asymmetrical construction the RR-EA-O is only able to erect precast concrete units in one direction. This anchor is particularly designed for thin-walled elements.

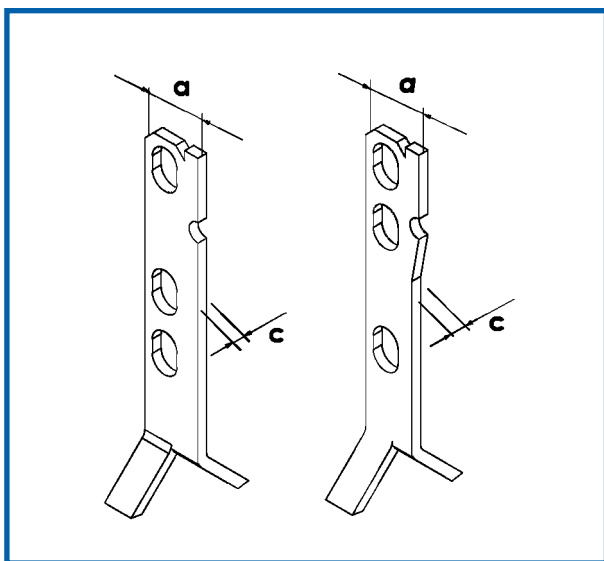


Fig. 22

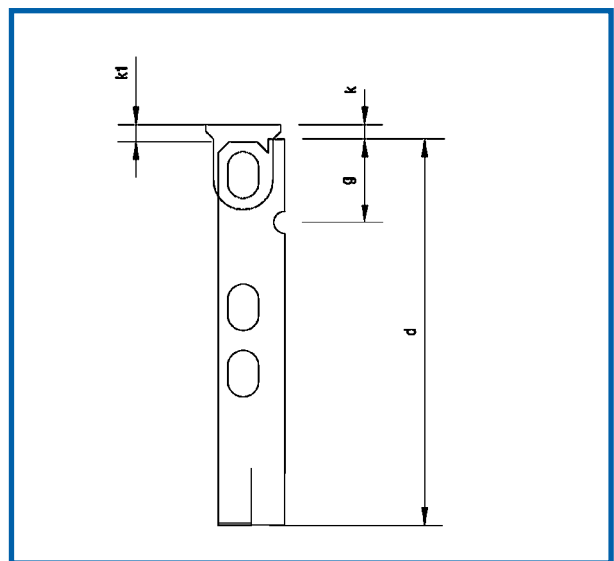


Fig. 23

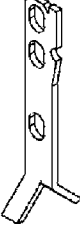
RR erection anchors one-sided	Load group	Load category	Designation	Article No.	Length d [mm]	Width a [mm]	Hole b [mm]	Thickness c [mm]	Length g [mm]	Installation depth k [mm]	Installation depth k1 [mm]	Weight [kg]
	2,5	1,4	RR-EA-O-1,4-200	16722010	200	40	14	6	42,2	10	5	0,38
		2,5	RR-EA-O-2,5-230	16722020	230	40	14	10	42,5	10	5	0,47
	5,0	4,0	RR-EA-O-4,0-270	16722030	270	55	18	12	50,5	10	5	1,40
		5,0	RR-EA-O-5,0-290	16722040	290	55	18	15	50,5	10	5	1,88
	10,0	7,5	RR-EA-O-7,5-320	16722050	320	80	26	15	78	15	6	3,00
		10,0	RR-EA-O-10,0-390	16722060	390	80	26	20	78	15	6	4,90
	26,0	12,5	RR-EA-O-12,5-500	16722070	500	115	35	20	88,5	15	9	9,00
		17,0	RR-EA-O-17,0-500	16722080	500	115	35	25	88,5	15	9	11,10
		22,0	RR-EA-O-22,0-500	16722090	500	115	65	30	88,5	15	9	13,00

Table 12: Dimensions of the erection anchors one-sided

3.3.3. Distances and allowed loads for the RR-EA and RR-EA-O anchors

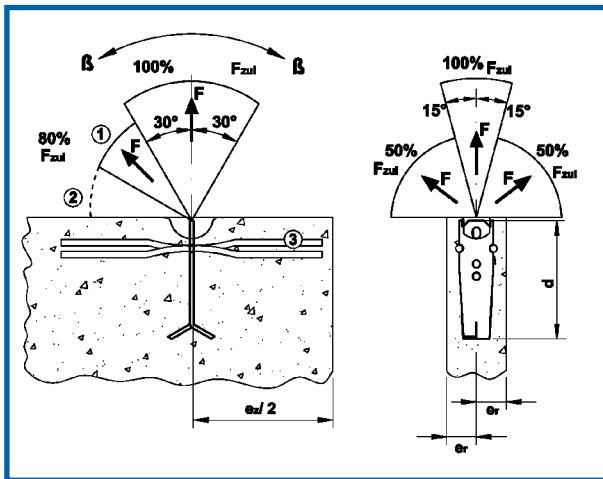


Fig. 24

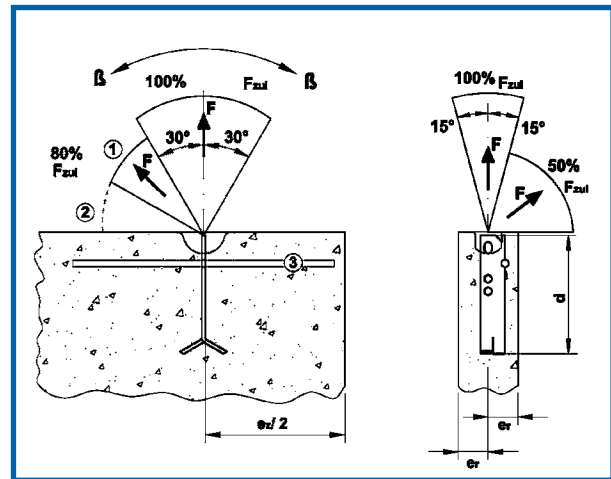


Fig. 25

In case of using a concrete strength $w \geq 23 \text{ N/mm}^2$ it is possible to make $F_{\text{allowed}} 100\%$.

- ② An angle $> 60^\circ$ is not allowed!
- ③ The oblique tension reinforcement is to be inserted in the semicircular notch of the anchor

RR ANCHOR SYSTEM

Load group	Load category	Length of anchor d [mm]	Centre distance of the anchors e_z [mm]	Minimum thickness of building unit ($2 \times e_r$)				Transport Tension	Oblique tension	Setting up
				With extra tension reinforcement	Without extra tension reinforcement	With extra tension reinforcement	Without extra tension reinforcement	$\beta \leq 30^\circ$ 100% F_{zul}	$\beta > 30^\circ$ 80% F_{zul}	50% F_{zul}
				RR-EA-O	RR-EA	RR-EA-O	RR-EA	[kN]	[kN]	[kN]
2,5	1,4	200	700	90	100	90	100	14	11	7
	2,5	230	800	120	120	120	120	25	20	13
5,0	4,0	270	950	140	150	150	150	40	32	20
	5,0	290	1000	140	160	180	180	50	40	25
10,0	7,5	320	1200	160	175	200	200	75	60	38
	10,0	390	1500	200	200	250	250	100	80	50
26,0	12,5	500	1500	240	240	320	320	125	100	62,5
	17,0	500	1500	300	300	380	380	170	136	85
	22,0	500	1500	360	360	450	450	220	176	110

Table 13: Distances and allowed loads

3.3.4. Reinforcement in the anchor area for RR-EA and RR-EA-O anchors

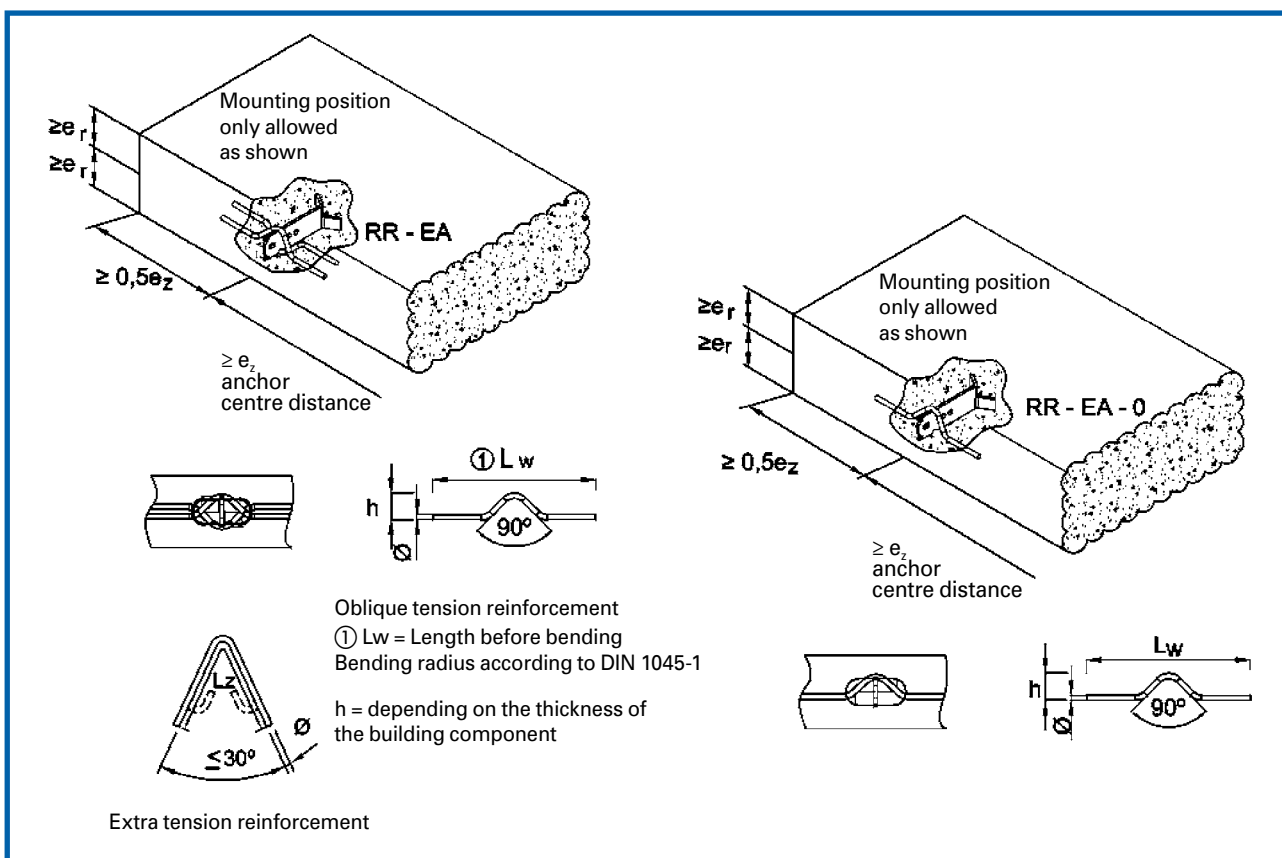


Fig. 26

The transverse tension reinforcement lies directly below the external layer of the surface reinforcement. When using both-sided transverse tension reinforcement no additional oblique tension reinforcement will be necessary.

Installation without extra tension reinforcement:

The same wire mesh reinforcements, peg-hoops and

edge reinforcements shall be used (see Table 7) as for the RR-SA-anchors.

Installation with extra tension reinforcement:

The same wire mesh reinforcements, peg-hoops and edge reinforcements shall be used (see Table 10) as for the RR-HA-anchors.

The following data apply for a concrete strength of $\beta_w \geq 15 \text{ N/mm}^2$

Load group	Load category	Transverse tension reinforcement BSt 500S $\varnothing \times L_w$ *) [mm]	Extra tension reinforcement BSt 500S $\varnothing \times L$ [mm]
2,5	1,4	$\varnothing 10 \times 700$	$\varnothing 10 \times 650$
	2,5	$\varnothing 12 \times 800$	$\varnothing 12 \times 1000$
5,0	4,0	$\varnothing 14 \times 950$	$\varnothing 16 \times 1200$
	5,0	$\varnothing 16 \times 1000$	$\varnothing 16 \times 1500$
10,0	7,5	$\varnothing 20 \times 1200$	$\varnothing 20 \times 1750$
	10,0	$\varnothing 20 \times 1500$	$\varnothing 20 \times 1900$
26,0	12,5	$\varnothing 25 \times 1500$	$\varnothing 25 \times 2200$
	17,0	$\varnothing 25 \times 1800$	$\varnothing 28 \times 2500$
	22,0	$\varnothing 25 \times 1800$	$\varnothing 28 \times 3000$

Table 14: Reinforcement of thin building components

*) When other concrete strengths are used, it is allowed to reduce the length of the extra tension reinforcement in proportion to the allowed bond stress ($\beta_w = 25 \text{ N/mm}^2$: $\times 0,8$; $\beta_w = 35 \text{ N/mm}^2$: $\times 0,65$). If lower concrete strength or lightweight concrete is used, please contact our technical department.

3.4. Dimensions of Peikko RR-PA plate anchors

Because of its low total high the Peikko RR-PA slab anchor is mainly suitable for thin, large-area slabs. The anchor plate has to be reinforced crosswise with lengths of concrete re-bars (see Fig. 28)

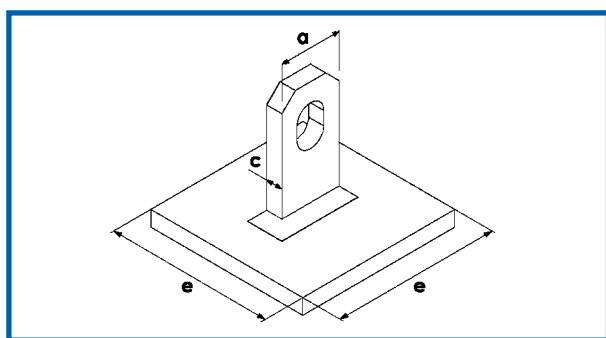


Fig. 27

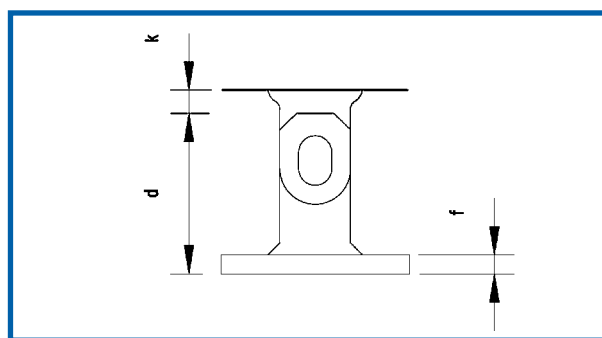


Fig. 28

RR plate anchors	Load group	Load category	Designation	Article No.	Length d [mm]	Width a [mm]	Thickness c [mm]	Thickness f [mm]	Installation depth k [mm]	Weight [kg]
	2,5	1,4	RR-PA-1,4-50	16730010	55	30	6	8	10	0,490
		2,5	RR-PA-2,5-80	16730020	80	30	10	8	10	0,550
	5,0	5,0	RR-PA-5,0-120	16730030	120	40	15	10	10	1,260
	10,0	10,0	RR-PA-10,0-160	16730040	160	60	20	12	15	3,150

Table 15: Dimensions of the slab anchors. Other dimensions on inquiry.

RR ANCHOR SYSTEM

3.4.1. Distances and allowed loads for RR-PA anchors, extra reinforcement for thin slabs and pipes

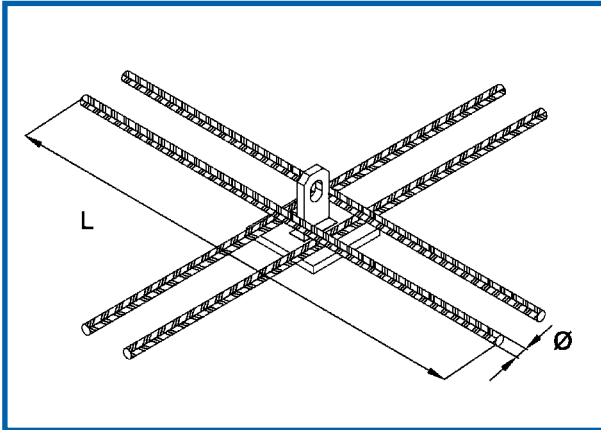


Fig. 29

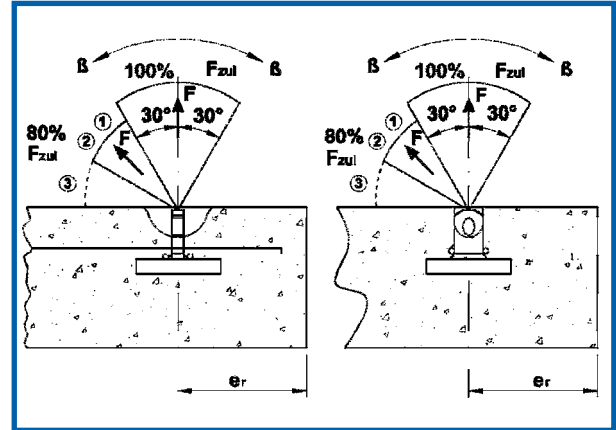


Fig. 30

- ① Oblique tension with $30^\circ < \beta \leq 60^\circ$ without oblique tension reinforcement only allowed if:
 $\beta_w \geq 15 \text{ N/mm}^2$ and 3 x the minimum thickness of the structural element
 $\beta_w \geq 25 \text{ N/mm}^2$ and 2.5 x the minimum thickness of the structural element
 $\beta_w \geq 35 \text{ N/mm}^2$ and 2 x the minimum thickness of the structural element Minimum thickness is 2 x e_r
- ② With concrete strength $\beta_w \geq 23 \text{ N/mm}^2$ it is allowed to make $F_{\text{allowed}} 100\%$
- ③ An angle $\beta > 60^\circ$ caused by inclination of the rope is not allowed!

Load group	Load category	Designation	Length d [mm]	Minimum edge distance or centre distance		Extra reinforcement		100% F_{allowed} tension $\beta \leq 30^\circ$ [kN]	80% F_{allowed} oblique tension $\beta > 30^\circ$ [kN]
				e_r [mm]	e_z [mm]	\emptyset [mm]	L [mm]		
2,5	1,4	RR-PA-1,4-50	55	115	230	8	200	14	11,2
	2,5	RR-PA-2,5-80	80	165	330	10	300	25	20
5,0	5,0	RR-PA-5,0-120	120	240	480	12	450	50	40
10,0	10,0	RR-PA-10,0-160	160	330	660	16	600	100	80

Table 16: Reinforcement and distances for concrete strength

3.5. Dimensions of Peikko RR-FA foot anchors (T-anchors)

The Peikko RR-FA foot anchor is another version of the RR-PA slab anchor. These anchors are mainly used for precast concrete components having a minimum concrete strength of 25 N/mm² when lifted.

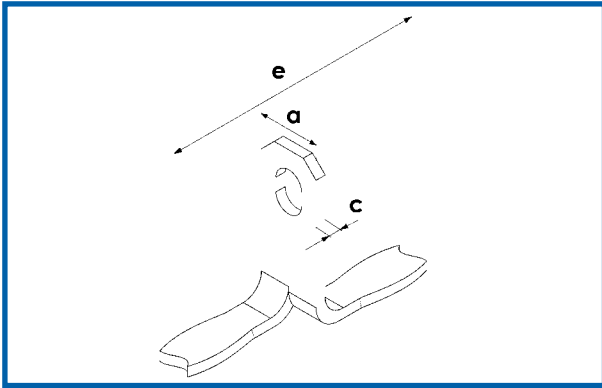


Fig. 31

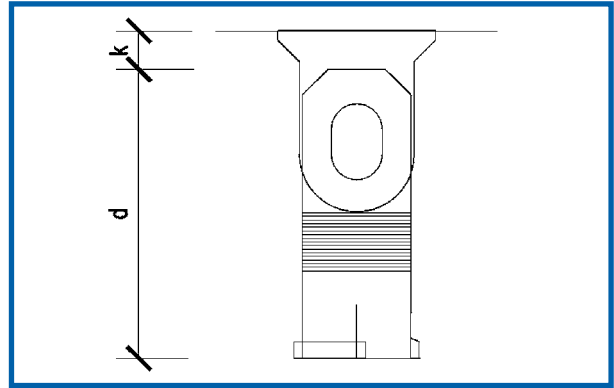


Fig. 32

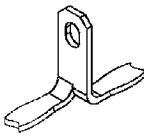
RR flat foot anchor	Load group	Load category	Designation	Article No.	Width a [mm]	Thickness c [mm]	Length d [mm]	Length e [mm]	Installation depth k [mm]	Weight [kg]
	2,5	0,7	RR-FA-0,7-60	16740010	30	5	65	70	10	0,10
		1,4	RR-FA-1,4-60	16740020	30	6	65	70		0,11
		2,0	RR-FA-2,0-70	16740030	30	8	70	80		0,18
		2,5	RR-FA-2,5-70	16740030	30	10	75	94		0,22
	5,0	3,0	RR-FA-3,0-90	16740040	40	10	90	100	10	0,34
		4,0	RR-FA-4,0-110	16740050	40	12	110	100		0,36
		5,0	RR-FA-5,0-120	16740060	40	15	125	105		0,98
	10,0	7,5	RR-FA-7,5-170	16740080	60	16	170	120	15	1,51
		10,0	RR-FA-10,0-200	16740090	60	20	200	120		2,06
	26,6	12,5	RR-FA-12,5-220	16740100	80	16	220	200	15	2,75
		17,0	RR-FA-17,0-270	16740110	80	20	270	200		3,90
		22,0	RR-FA-22,0-310	16740120	90	28	310	200		5,75

Table 17: Dimensions of the foot anchors

RR ANCHOR SYSTEM

3.5.1. Reinforcement in the anchor area for the RR-FA anchors

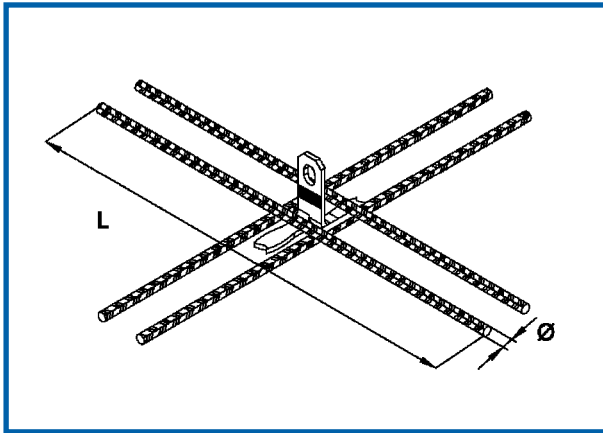


Fig. 33

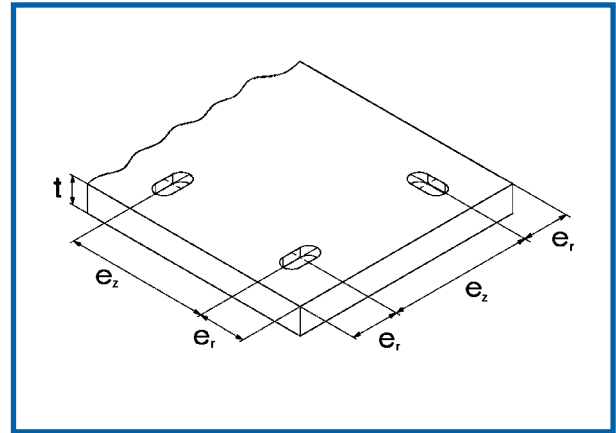


Fig. 34

For forces which work in direction of the component edge the oblique tension reinforcement has to be inserted like the reinforcement of the RR-SA or the RR-HA anchors. The reinforcement should be positioned as close as possible to the anchor.

Load group	Load category	Designation	Length of the anchor d [mm]	Minimum building component thickness t [mm]	Minimum edge distance or centre distance		Extra reinforcement BSt 500S		Allowed load-bearing capacity for axial tension, oblique tension, and transverse tension for lifting strength β_w		
					e_r [mm]	e_z [mm]	\varnothing [mm]	L [mm]	$\geq 15 \text{ N/mm}^2$ [kN]	$\geq 25 \text{ N/mm}^2$ [kN]	$\geq 35 \text{ N/mm}^2$ [kN]
2,5	0,7	RR-FA-0,7-60	65	95 *)	140	210	8	200	7	7	7
	1,4	RR-FA-1,4-60	65	95 *)	140	210	8	250	14	14	14
	2,5	RR-FA-2,5-70	75	105 *)	160	240	8	300	20	25	25
5,0	3,0	RR-FA-3,0-90	90	120	190	285	10	400	28	30	30
	4,0	RR-FA-4,0-110	110	140	230	345	12	450	37	40	40
	5,0	RR-FA-5,0-120	125	160	260	390	12	500	44	50	50
10,0	7,5	RR-FA-7,5-170	170	215	340	510	14	600	54,6	70,4	75
	10,0	RR-FA-10,0-200	200	245	400	600	14	600	75,5	100	100
26,0	12,5	RR-FA-12,5-220	220	265	440	660	16	750	88,5	125	125
	17,0	RR-FA-17,0-270	270	315	540	810	16	900	120,3	170	170
	22,0	RR-FA-22,0-310	310	355	620	930	20	1100	148	220	220

Table 18: Reinforcement in the anchor area

*) If corrosion protection is guaranteed it is allowed to reduce the thickness of the slab.

3.6. Dimensions of Peikko RR-DA double anchors

The Peikko DA double anchor is a special version of the two-hole anchor. The DA anchor is designed for the erection of columns and similar building components.

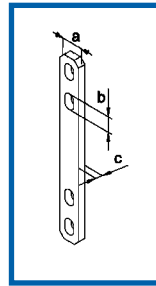


Fig. 35

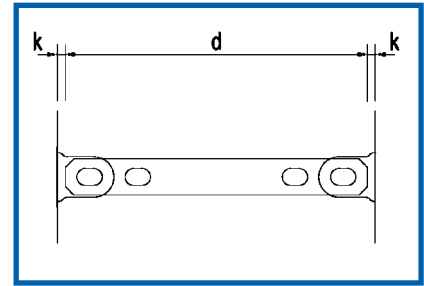


Fig. 36

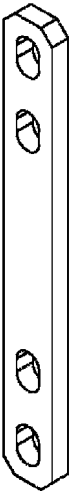
RR double anchor	Load group	Load category	Designation	Article No.	Width of the column	Length d [mm]	Width a [mm]	Hole b [mm]	Thickness c [mm]	Installation depth k [mm]	Weight [kg]
	2,5	2,5	RR-DA-2,5-230	167500010	250	228	30	14	10	10	0,450
			RR-DA-2,5-280	167500020	300	278	30	14	10	10	0,580
			RR-DA-2,5-330	167500030	350	328	30	14	10	10	0,680
	5,0	5,0	RR-DA-5,0-230	167500040	250	226	40	18	15	10	0,860
			RR-DA-5,0-280	167500050	300	276	40	18	15	10	1,090
			RR-DA-5,0-330	167500060	350	326	40	18	15	10	1,360
			RR-DA-5,0-380	167500070	400	376	40	18	15	10	1,570
			RR-DA-5,0-430	167500080	450	426	40	18	15	10	1,810
			RR-DA-5,0-480	167500090	500	476	40	18	15	10	2,040
	10,0	7,5	RR-DA-7,5-260	167500100	300	262	60	26	16	15	1,560
			RR-DA-7,5-310	167500110	350	312	60	26	16	15	1,930
			RR-DA-7,5-360	167500120	400	362	60	26	16	15	2,330
			RR-DA-7,5-410	167500130	450	412	60	26	16	15	2,670
			RR-DA-7,5-460	167500140	500	462	60	26	16	15	3,130
		10,0	RR-DA-10,0-260	167500150	300	262	60	26	20	15	1,940
			RR-DA-10,0-310	167500160	350	312	60	26	20	15	2,520
			RR-DA-10,0-360	167500170	400	362	60	26	20	15	2,910
			RR-DA-10,0-410	167500180	450	412	60	26	20	15	3,410
			RR-DA-10,0-460	167500190	500	462	60	26	20	15	3,830
	26,0	12,5	RR-DA-12,5-360	167500200	400	362	80	35	16	15	2,940
			RR-DA-12,5-410	167500210	450	412	80	35	16	15	3,430
			RR-DA-12,5-460	167500220	500	462	80	35	16	15	3,770
		17,0	RR-DA-17,0-360	167500230	400	362	80	35	20	15	3,800
			RR-DA-17,0-410	167500240	450	412	80	35	20	15	4,020
			RR-DA-17,0-460	167500250	500	462	80	35	20	15	4,810
		22,0	RR-DA-22,0-410	167500260	450	412	90	65	28	15	5,420
			RR-DA-22,0-460	167500270	500	462	90	65	28	15	6,130
			RR-DA-22,0-560	167500280	600	562	90	65	28	15	7,860

Table 19: Dimensions of the double anchor. Other lengths on inquiry.

RR ANCHOR SYSTEM

3.6.1. Allowed loads and reinforcement for RR-DA anchors

For installation the anchor has to be equipped on both sides with the appertaining recess-forming cup. Then the so pre-assembled anchors shall be pushed through the reinforcing bars and fixed on both sides of the formwork. Finally the anchor reinforcing bars shall be pushed through the intended holes in the anchor and fixed (for example with tying wire). An extra reinforcement has to be made according to the two-hole anchor.

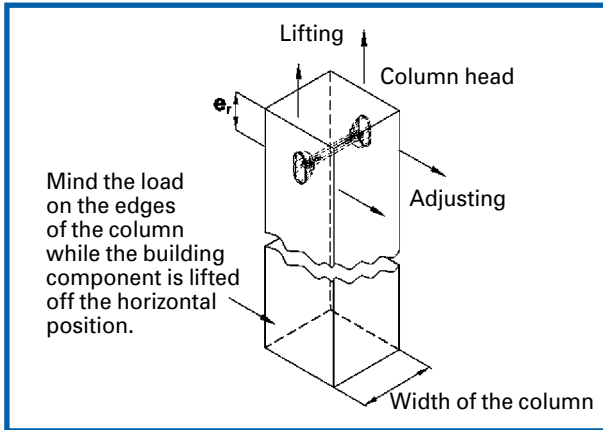


Fig. 37

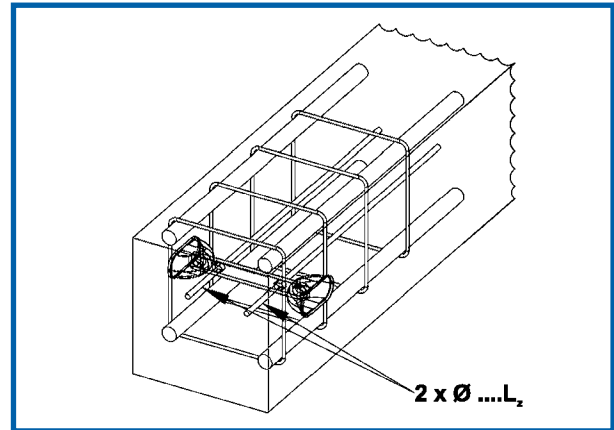


Fig. 38

Hint: The greater the dimension e_r , the higher the anchor load will be during lifting, but the smaller the load on the edge of the column-base will be.



Load group	Designation	Article No.	Reinforcement		Allowed column weight	
			d_s [mm]	l_s [mm]	 for $\beta_w \geq 15\text{N/mm}^2$ [kN]	 for $\beta_w \geq 25\text{N/mm}^2$ [kN]
2,5	RR-DA-2,5-230	167500010	12	750	40	50
5,0	RR-DA-5,0-230	167500040	16	1000	80	100
10,0	RR-DA-7,5-260	167500100	20	1200	120	150
	RR-DA-10,0-460	167500190	25	1500	160	200
26,0	RR-DA-12,5-360	167500200	25	1500	200	250
	RR-DA-17,0-460	167500250	28	1600	272	340
	RR-DA-22,0-560	167500280	28	2000	352	440

Table 20: Reinforcement of the double anchor

3.7. Dimensions of Peikko RR-SW sandwich slab anchors

The RR-SW anchor is designed especially for reinforced concrete multi-layer elements. Its special geometry allows hanging the building component along the centre line for transport and assembly. Here we recommend hot-dip galvanised anchors for sufficient corrosion prevention.

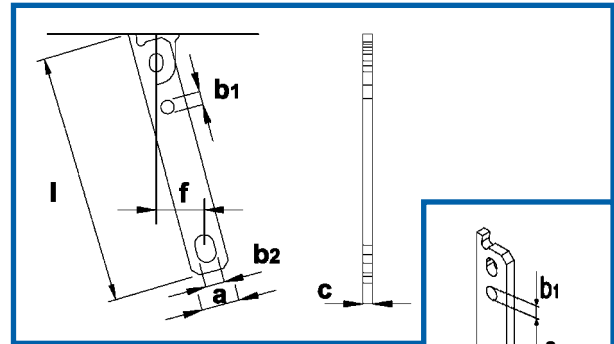


Fig. 39

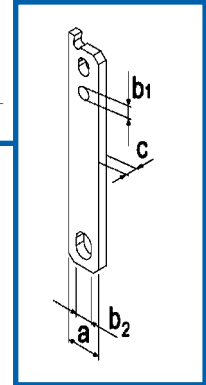


Fig. 40

Load group	Designation	Article No.	a [mm]	b1 [mm]	b2 [mm]	c [mm]	l [mm]	f [mm]
2,5	RR-SW-2,5-250	16755010	40	14	18	10	250	48
5,0	RR-SW-5,0-300	16755040	60	17,5	26	16	300	53
10,0	RR-SW-7,5-350	16755100	80	25	35	16	350	55
	RR-SW-10,0-350	16755150	80	25	35	20	350	55
26,0	RR-SW-17,0-400	16755230	100	30	35	20	400	66

Table 21: Dimensions of the RR-SW anchors

3.7.1. Reinforcement in the anchor area for RR-SW anchors

Because of the punched head of the anchor in an inclined form it becomes possible to insert the RR-SW anchor roughly in the centre line of large-sized reinforced concrete multi-layer elements. Thereby it is achieved that the concrete multi-layer elements hang nearly upright while they are transported and assembled. The head form of the anchor complies with the accessories programme of the Peikko RR-anchors.

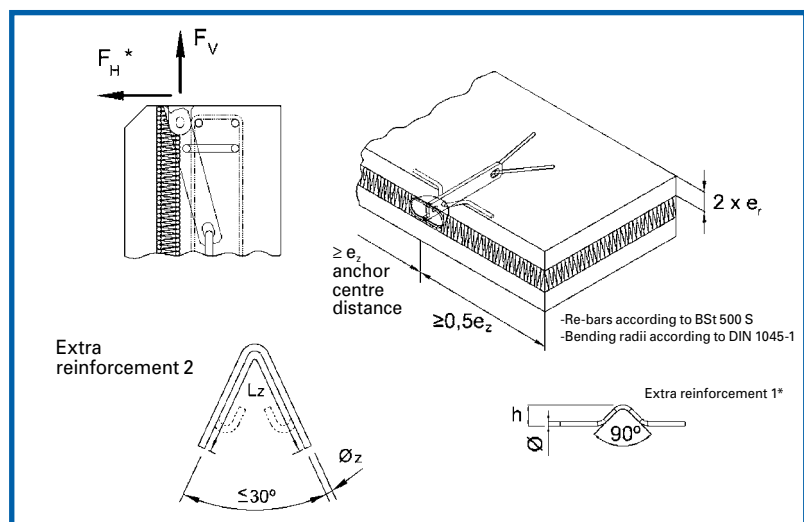


Fig. 41

RR ANCHOR SYSTEM



Load group	Designation	Minimum centre distance e_z [mm]	Thick-ness of the building component $2 \times e_r$ [mm]	Peg-hoop for tension BSt 500S $\varnothing \times \text{length}$ [mm]	Setting up reinforcement			Extra tension reinforcement		Allowed loads **)	
					d_{s1} [mm]	l_{s1} [mm]	h_1 *) [mm]	d_{s2} [mm]	l_{s2} [mm]	 [kN]	 [kN]
2,5	RR-SW-2,5-250	600	100	2 Ø8 x 600	10	600	60	14	800	25	8
5,0	RR-SW-5,0-300	750	120	2 Ø8 x 800	14	700	80	16	1200	50	18
10,0	RR-SW-7,5-350	1200	130	2 Ø10 x 800	16	800	100	25	1400	75	26
	RR-SW-10,0-350	1200	140	4 Ø10 x 800	20	900	120	25	1800	100	35
26,0	RR-SW-17,0-400	1500	180	4 Ø12 x 1200	20	1100	140	28	2500	170	50

Table 22: Reinforcement in the anchor area of RR-SW. Data valid for concrete strength

*) To guarantee sufficient corrosion protection we recommend hot-dip galvanised extra tension reinforcement.

**) The loads with oblique tension have to be reduced down to 80% for a concrete strength $\beta_w < 23 \text{ N/mm}^2$. Oblique tension should be avoided in general.

For putting up and transporting with RR-SW anchors it is recommended to use a cross beam, this avoids damages while raising, advancing and mounting.

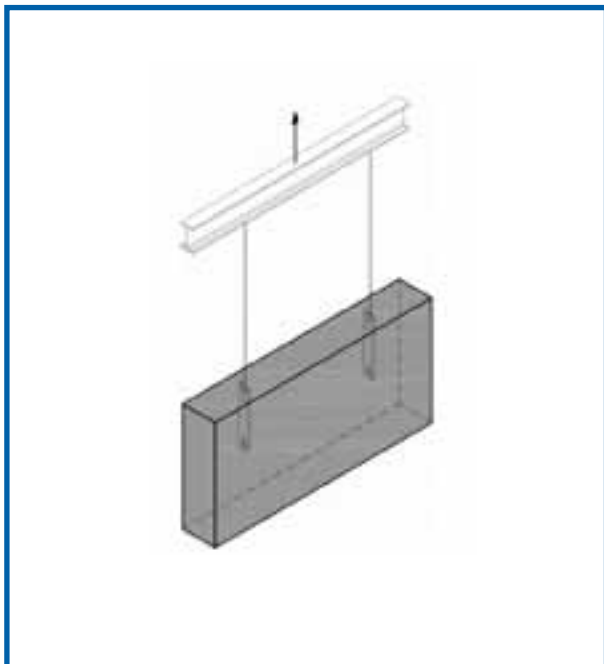


Fig. 42

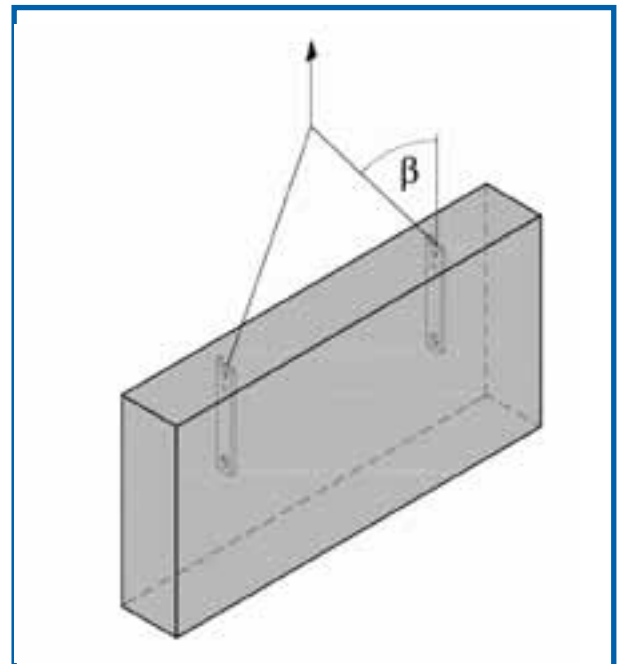


Fig. 43

Oblique tension should be avoided $\beta > 30^\circ$ is not allowed.

4. The Peikko RR Coupling

4.1. Standard configuration for manual releasing

The Peikko RR-C coupling is manufactured from high-quality steel. It consists of the coupling head and the flexible, in all directions movable hanging binder. The coupling head is equipped with a smooth-running, forged latch, which serves the sure and quick connection of coupling and Peikko RR-anchors. The design always implies a correct and unambiguous allocation of a Peikko RR-C coupling to a Peikko RR anchor. A wrong allocation of coupling and anchor is technically not possible.

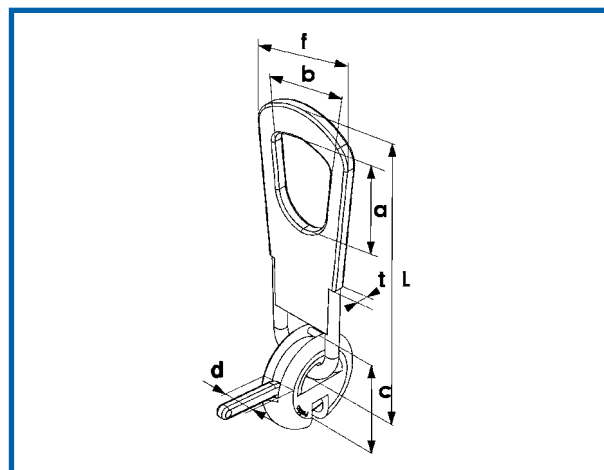


Fig. 44

Load group	Designation	Article No.	l [mm]	a [mm]	b [mm]	c [mm]	d [mm]	t [mm]	f [mm]
2,5	RR-C-2,5	16760010	265	70	59	80	27	12	95
5,0	RR-C-5,0	16760020	330	85	66	102	37	17	117
10,0	RR-C-10,0	16760030	425	110	85	150	50	25	148
26,0	RR-C-26,0	16760040	605	160	120	206	72	30	210

Table 23: Dimensions of the Peikko RR-C ring coupling

4.2. Ring coupling with wire rope loop

The Peikko RR-CW ring coupling is a special variation of the standard coupling RR-C. The division in four load groups as well as the design of the coupling heads are exactly the same. In contrast to the RR-C coupling the hanging binder is replaced by a flexible steel wire rope.



Fig. 45

Load group	Designation	Article No.	l × [mm]	c [mm]	d [mm]	ø d _s [mm]
2,5	RR-CW-2,5	16760011	560	80	27	14
5,0	RR-CW-5,0	16760021	595	102	37	18
10,0	RR-CW-10,0	16760031	700	150	50	22
26,0	RR-CW-26,0	16760041	1570	206	72	32

Table 24: Dimensions of the Peikko RR-CW ring coupling

RR ANCHOR SYSTEM

4.3. Use of the Peikko RR-C ring coupling

The Peikko RR-C ring coupling is used as a load-carrying means within the Peikko transport anchor system. The engagement and the releasing are easy and safe. The coupling can be used for all load cases (axial, transverse, and oblique tension). To ensure the correct position of the anchor and the necessary recesses suitable recess-forming cups should be used.

4.3.1. Engagement

The ring coupling is inserted in the recess with the opening of the coupling head over the anchor, which is fixed in the concrete. The latch will be in position A (see marking at the coupling head). Then the latch is moved by hand into position B to establish a secure connection between anchor and coupling (see Fig. 46).

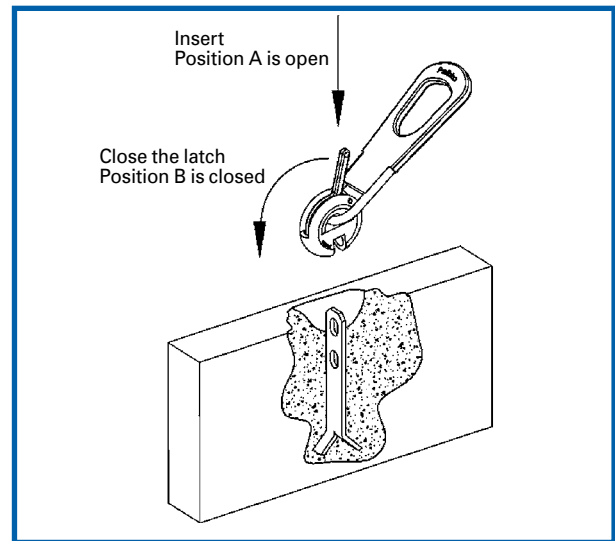


Fig. 46

4.3.2. Handling

The Peikko RR-C ring coupling is loadable in all directions under the allowable loads of the anchors being used. Oblique tension as a result of rope inclination is allowed to a maximum of 60° (see Fig. 47).

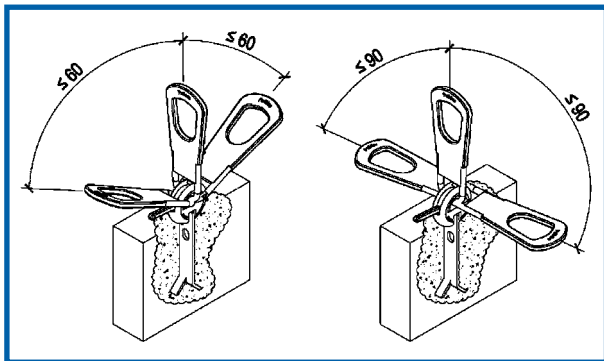


Fig. 47

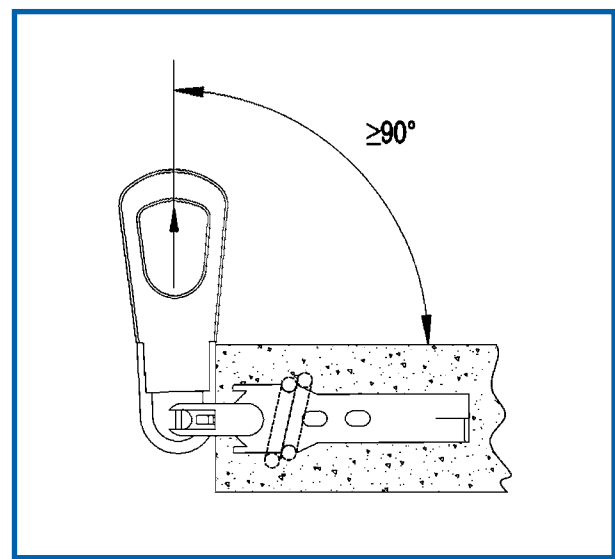


Fig. 48

4.3.3. Releasing

After unloading the coupling the latch is moved manually back into position A. In this condition the coupling can be easily removed from the anchor (see Fig. 49).

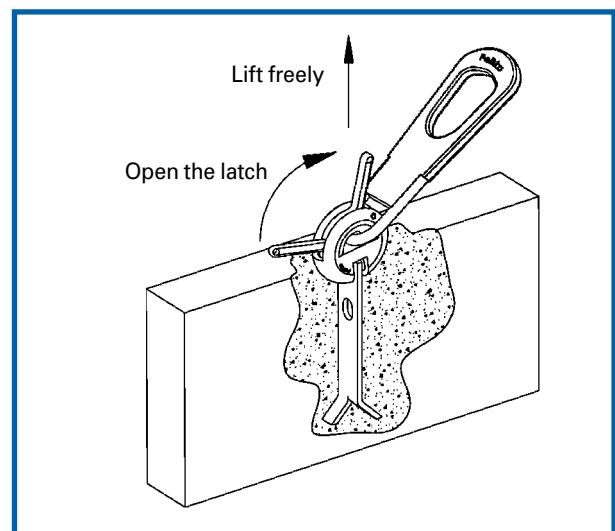


Fig. 49

4.3.4. Possible incorrect uses

If the hanging binder lies under the coupling head while load is being applied, as shown in Fig. 50, then it could jam in this position. This may cause that the anchor deforms when lifting up the building component.

In the position mentioned above the hanging binder can block in the coupling head. A too shallow angle of the hanging rope may effect a deformation of the hanging binder. The problem can be solved by rotating the hanging binder by 45° (see Fig. 51). In Figure 52 shows how the hanging binder is pulled in the direction of the slab surface. Due to this the slab hanger can also be deformed or serious flaking could occur in the concrete.

4.4. Safety instructions

The Peikko RR-C ring coupling is a load-carrying element. According to BGR 500 Chapter 2.8 it has therefore to be checked yearly for perfect condition and function. The check is responsibility of the contractor and has to be done by an expert.

In general, the current accident prevention instructions or the national regulations will be binding. The use of the correct anchor size and form can affect the durability of the RR-C ring coupling in a positive sense. Sharp-edged hooks or ones with too small a cross section and tight bend radii could abrade the coupling strongly and lead to its premature scrapping. Peikko RR-CW couplings, in a perfect condition of the coupling head, can be refurbished with a new wire rope through Peikko, when the rope reaches the scrapping condition prematurely or has been damaged.

The components of the Peikko RR-C ring coupling are subjected to a targeted heat treatment in a special production process. To guarantee such achieved characteristics of the coupling it is absolutely forbidden to perform welding or other strong heat affections. Acids, alkalies and other aggressive media which can cause corrosion should be kept away from the couplings, particularly those with a wire rope terminal.

If unusual loads are applied, as for example in a damage event, then the coupling has to undergo an extraordinary investigation by an expert (compare BGR500, Chapter 2.8 Paragraph 3.15.4.).

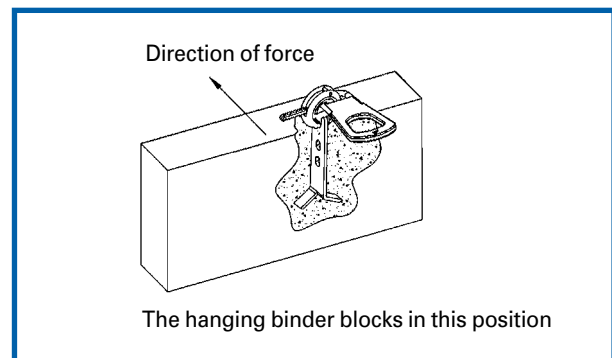


Fig. 50

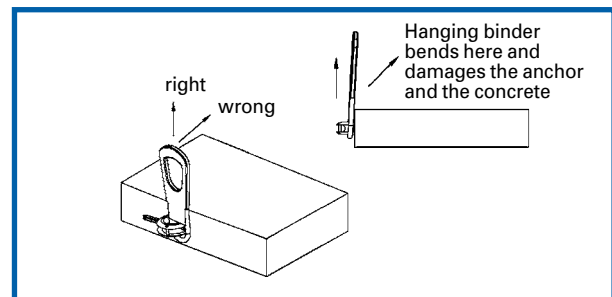


Fig. 51

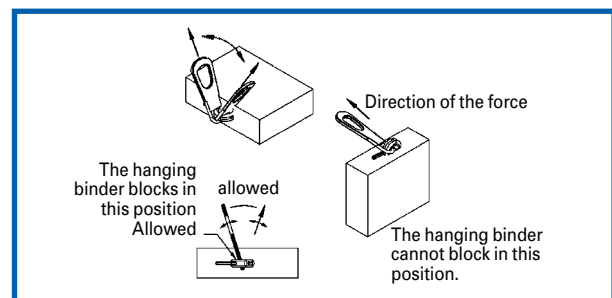


Fig. 52

RR ANCHOR SYSTEM

4.4.1. Inspection of the Peikko RR-C and RR-CW ring coupling

The Peikko RR-C ring coupling has to be visually inspected every time before it is used. For this purpose the coupling has to be cleaned to make possibly present damages visible. The following points serve as a reference in assessing the condition of the coupling:

Standard couplings:

- The hanging binder should not show any visible cracks or be bent
- The side ribs in the hanging binder should not get thinner in material
- No welds whatsoever are allowed in the parts of the couplings
- The marking of the coupling must be unequivocal and clearly legible
- The coupling head should not have any distortions or cracks
- Repairing the coupling head and the hanging binder is not possible. Damages mean immediately dispensing with the coupling.
- The dimensional limits of the coupling head and the latch have to be within the given tolerances in Table 26.

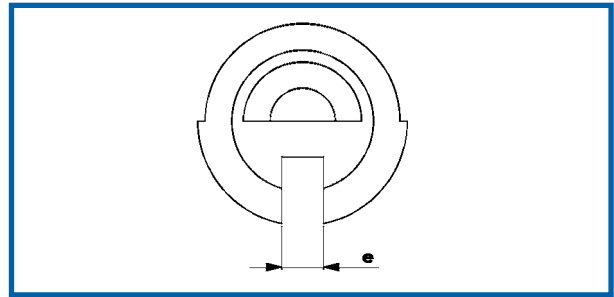


Fig. 53: Coupling head

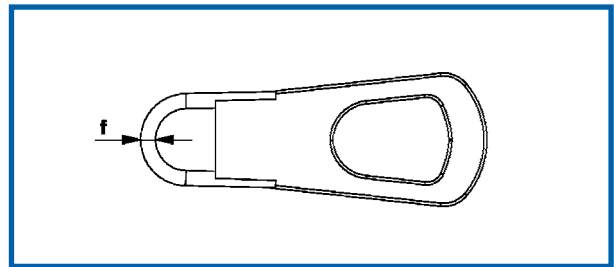


Fig. 54: Hanging binder

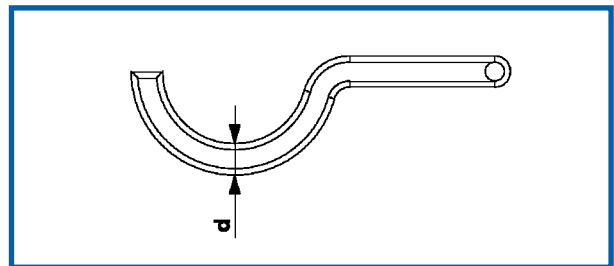


Fig. 55: Latch

Load group	Coupling head		Hanging binder		Latch	
	Specified dimension e [mm]	Maximum allowed e [mm]	Specified dimension $\varnothing f$ [mm]	Minimum $\varnothing f$ [mm]	Specified dimension $\varnothing d_2$ [mm]	Minimum $\varnothing d_2$ [mm]
2,5	12	13	14	13	13	12
5,0	18	19,5	20	19	16,5	15,5
10,0	22	23,5	26	25	23,5	22,5
26,0	34	37	40	38,5	32	30,5

Table 25: Dimensional limits

Also to inspect when couplings with steel wire rope are used:

- No kinks in the rope are allowed
- No strand breakages are allowed
- No relaxation of the external free layer in the free length of the rope is allowed
- No crushings or bruises in the free length of the rope are allowed
- No more than four wire breakages in the bearing area of the rope eye
- No damage or progressive wear of the rope or the rope connection
- A large number of broken wires (see Table 27) make it compulsory to dispose of the coupling.

Type of rope	Number of visible wire breakages within a length of		
	$3 \times d_s$	$6 \times d_s$	$30 \times d_s$
Rope made of strands	4	6	16

Table 26: Wearing limits in case of wire breakage

5. Anchor Installation. Hints and Examples

Only the careful and expert installation of all the components (anchor, extra reinforcement, etc.) could guarantee reliable functioning and an optimum safety. The installation instructions of the anchor system RR must, in general, be made available during installation. Recommendation: The recess-forming cups should always be lightly greased before use in order to be easily removed afterwards.

5.1. Floating installation with holding plate RR-HP

Use: Columns, beams, binders, H-slabs

Installation help: Holding plate RR-HP

The recess-forming cup RR-RF should be opened and pushed over the anchor head. Now the holding plate can be inserted in the holes of the recess-forming cup. This pre-assembled component is pressed vertically in the fresh concrete. It should be seen that the upper edge of the recess-forming cup be flush with the concrete surface. The recess-forming cups should be lightly greased before use in order to be easily removed afterwards.

Hint: Floating installation may not be allowed any more by some national regulations.

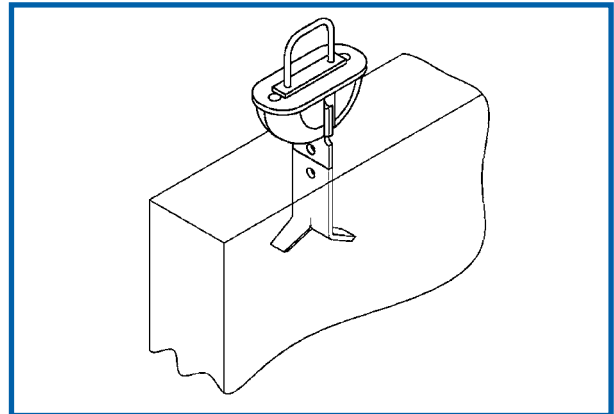


Fig. 56

5.2. Assembly with RR-NP nailed plate

Use: For components in wooden formworks

Installation help: Nailed plate RR-NP

The RR-NP nailed plate is nailed at the desired place on the formwork or is fixed with screws. The anchor with the recess-forming cup is pre-assembled such as described in 5.1 and then put on the plug of the fixed nailed plate. It is not recommended to nail the recess-forming cup directly in the formwork, because then the later removal will be difficult.

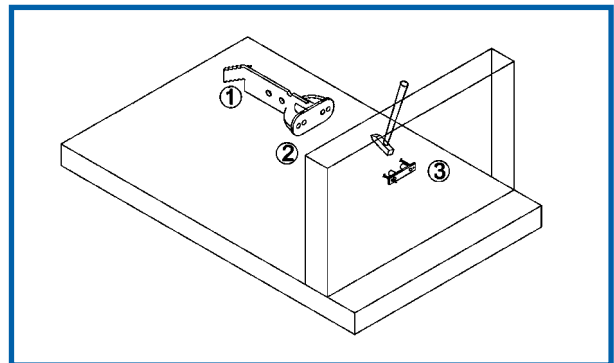


Fig. 57

5.3. Assembly with RR-FS fixing screw

Use: For components in steel formworks or wooden formworks

Installation help: fixing screw RR-FS

The formwork is through-drilled at the desired place, so that the fixing screw can be inserted through the side wall. The recess-forming cup can be pre-assembled with the anchor as described before. Then the fixing screw can be driven in the threaded socket. Using the movable wing nut, the cup can then be pulled close to the formwork wall.

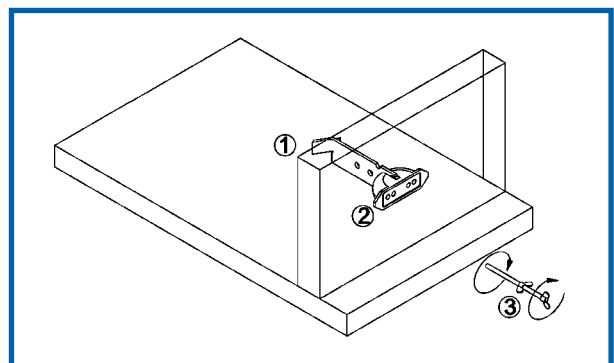


Fig. 58

5.4. Assembly with RR-MH magnetic holder

Use: for components in steel formworks

Installation help: Magnetic holder RR-MH

The magnetic holder has a particularly strong clinging force and is placed at the intended place of the steel formwork. To use the holding force optimally the surface has to be free of concrete leftovers and has to be flat. The anchor is pre-assembled as already described with the recess-forming cup and then is put on the plug of the magnetic holder. The magnetic holder plate should also be lightly greased for easier removal.

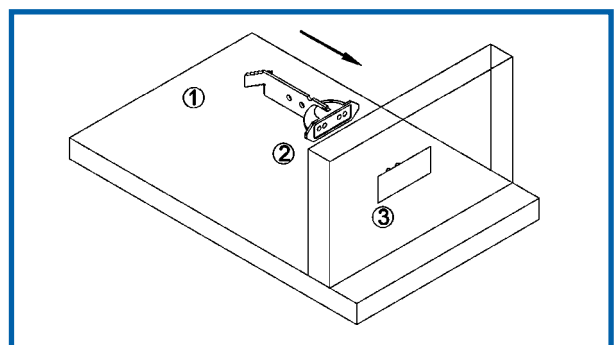


Fig. 59



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