
HILTI
Hilti HAC anchor channels
SELECT YOUR INNOVATION.
Hilti. Outperform. Outlast.

Introduction

Dear Customer,

We have extended our already extensive range of fastening products with the addition of an innovative, high-performance cast-in anchor channel system.

The channel has been used in hundreds of projects worldwide since 2011.

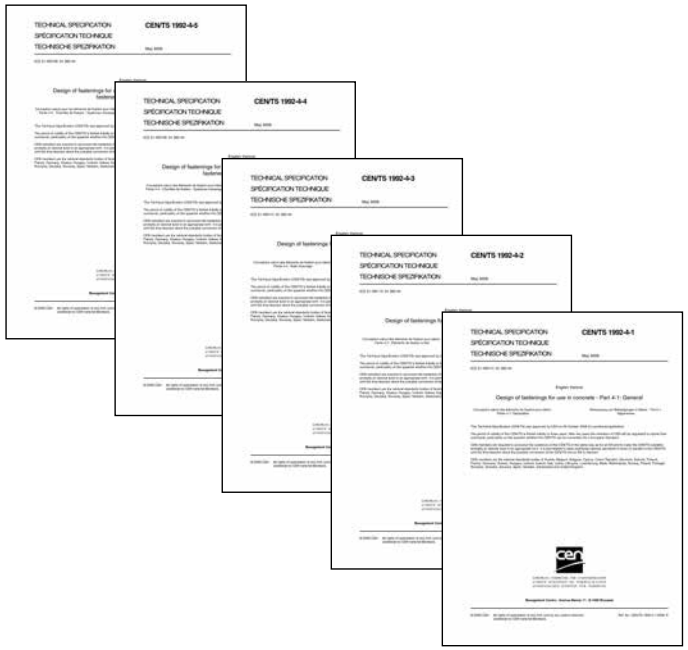
The design aid presented here is intended to help you design fastening points quickly and reliably, using anchor channels. The complex design calculation algorithms that form part of the European Code CEN TS 1992-4 have been laid out in clearly-arranged tabular form. With this aid you can quickly obtain accurate values in accordance with the given parameters and reliably estimate intermediate values in cases where the actual parameters lie between those listed in the tables.

As your reliable partner, we constantly make every effort to further improve the products and services we offer. We would therefore be very pleased to receive your feedback and look forward to answering any questions you may have, at any time, on the topic of anchor channels.

Raimund Zaggl
Senior Vice-President
Business Unit Anchor
Hilti Corporation, Schaan (LI)

Table of contents

State-of-the-art anchor channel design with the new CEN TS 1992-4.



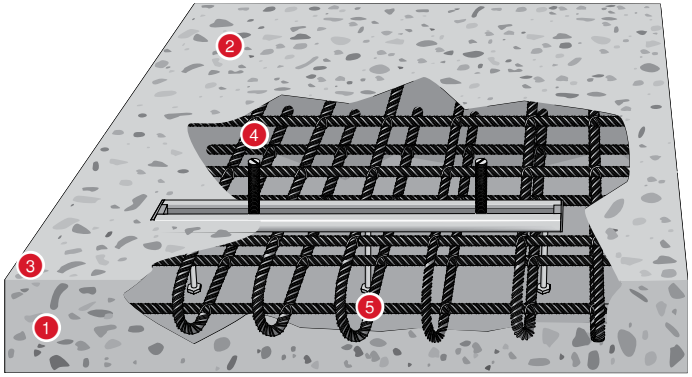
With the introduction of the European code CEN/TS 1992-4-3, the design of anchor channel fastenings has been given a new foundation. The new calculation method is based on extensive research and represents the state of the art.
The new code features:

- Perfect compatibility with the Eurocode code generation
- Partial safety factor concept
- New calculation model taking specific parameters into account

Channel-dependent input data for the calculation model described in CEN/TS 1992-4 is backed by a European Technical Approval (ETA).

The new model allows better utilization of the materials involved and greater flexibility in designing the fastening. This leads to an optimized, more cost-efficient solution for the fastenings you are designing.

The following parameters are now taken into account in the calculations:

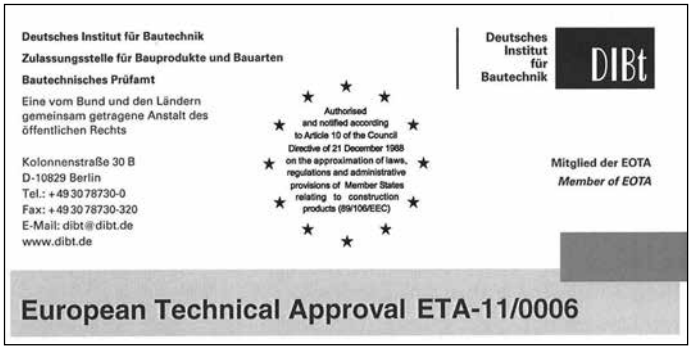


1. **Member thickness**
2. **Concrete grade, cracked / uncracked**
3. **Edge / corner distance**
4. **Load type / position**
5. **Supplementary reinforcement**

Hilti's ETA approval for anchor channels goes beyond the requirements.

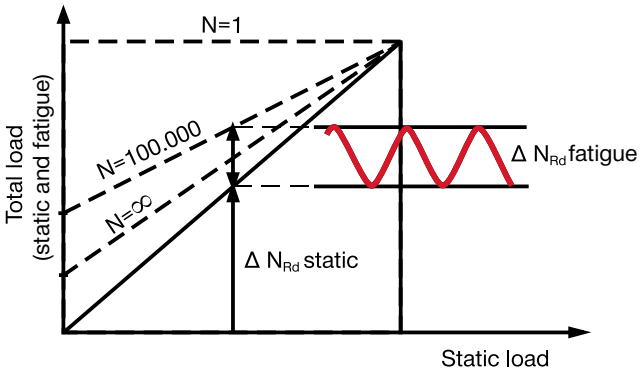
The Hilti Anchor Channel System was awarded European approval ETA-11/0006 in February 2011.
An updated version containing additional enhanced values was released on February 28, 2012.
The new Anchor Channel System features:

- Excellent resistance and versatility due to its innovative V-shape
- A well-sealed system composed of an environmentally friendly LDPE foam strip with tear-out band and end caps
- A simplified system that significantly reduces the number of different items

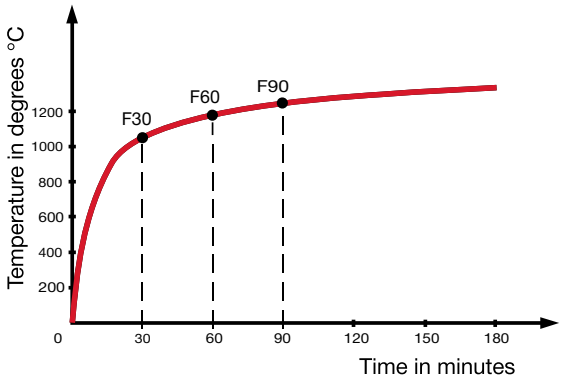


In addition to the provisions in CEN-TS 1992-4, the European Technical Approval awarded to Hilti covers design models for fatigue and for loads occurring in the event of fire.

The new design model for pulsating tensile stresses allows static preloading as well as the number of load cycles to be taken into account. The model is based on Woehler curves determined experimentally and in conjunction with the Goodman diagram.



With this new design concept it is now possible to design anchor channels in accordance with the Eurocode for the tensile and shear loads occurring in the event of fire. The design is based on EOTA TR 020 and CEN-TS 1992-4-1.
The following fire ratings are included: F30, F60 and F90. Basis of the calculation is the standard temperature curve (ETK and ISO 834, DIN 4102 T2).



Guaranteed product quality

In accordance with the ETA concept, the Hilti Anchor Channel System is subject to ongoing quality checks by internal and certified external inspection agencies (MPA, Stuttgart, Germany). Records are kept of all test data. Only the materials and processes listed in the approval are used in manufacturing. This ensures that the quality of the Hilti Anchor Channel System remains constantly high. Hilti's processes are certified in accordance with ISO 9001, for lasting safety and reliability.

Unique markings for reliable identification.

Markings on Hilti HAC anchor channels

Hilti anchor channels have distinct markings on the outside surface that allow correct identification before casting in concrete. The markings consist of the Hilti logo, the channel type designation and the type of corrosion protection.
The channels bear a unique production number that indicates the production lot as well as the channel type, to aid identification.

The same markings can be found inside the channel. These are visible after removal of the foam strip and allow identification after installation (i.e. after casting in).

Markings on Hilti HBC bolts

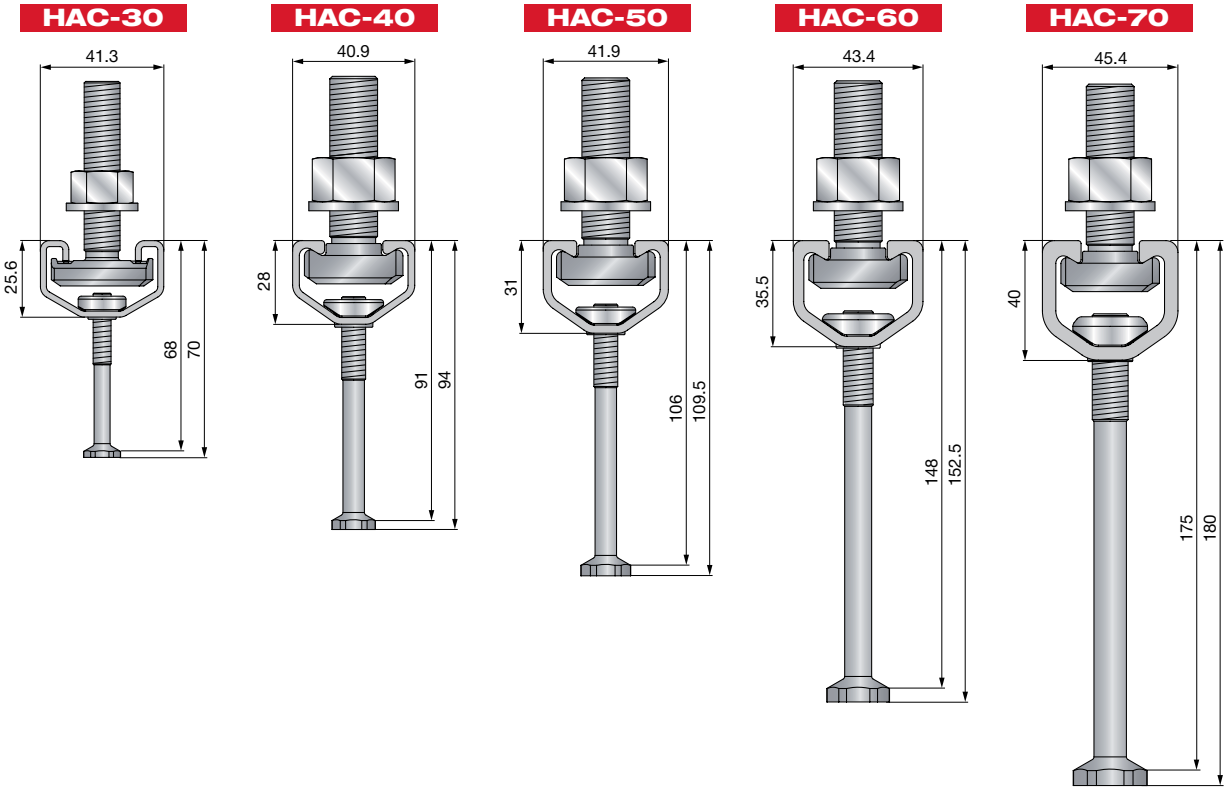
Hilti bolts bear marks on the head indicating the bolt type, strength class, corrosion class and also include a manufacturing mark. The tip of the bolt features a distinct groove that provides a clear indication of bolt head alignment. Bolts with notched heads (“notched bolts”) can be identified after installation by the 2 grooves in the tip.

The new anchor channel generation for strong and reliable cast-in fastening.

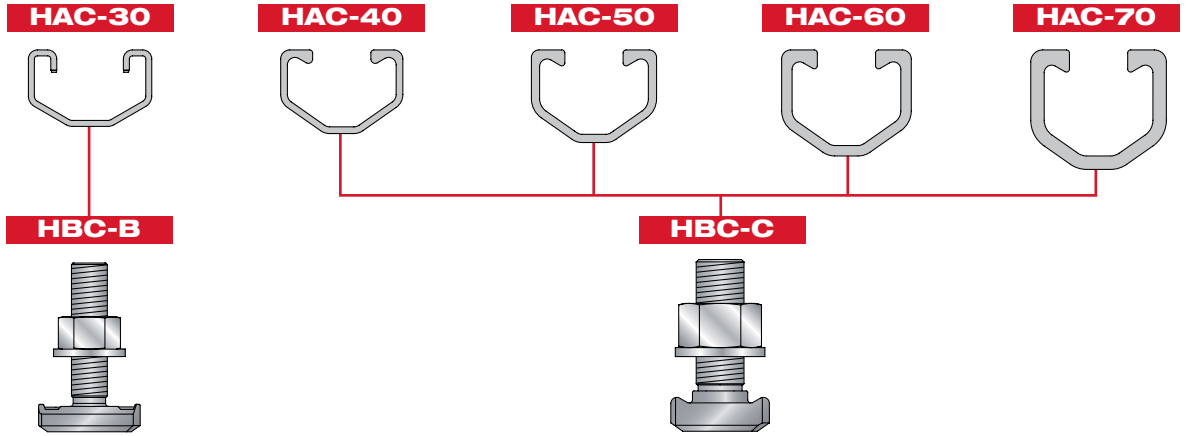
Channels
The channels feature hot-dip galvanizing. Special uncoated “black” channels with a rectangular cross-section are also available for use in applications where welded connections are required.

Available in 7 different standard profiles in lengths between 100 mm and 5850 mm.

Customer-specific lengths are available on request.



Bolts
The T-head bolts are available in various lengths and diameters. Stainless steel, galvanized and hot-dip galvanized versions provide various levels of corrosion protection.



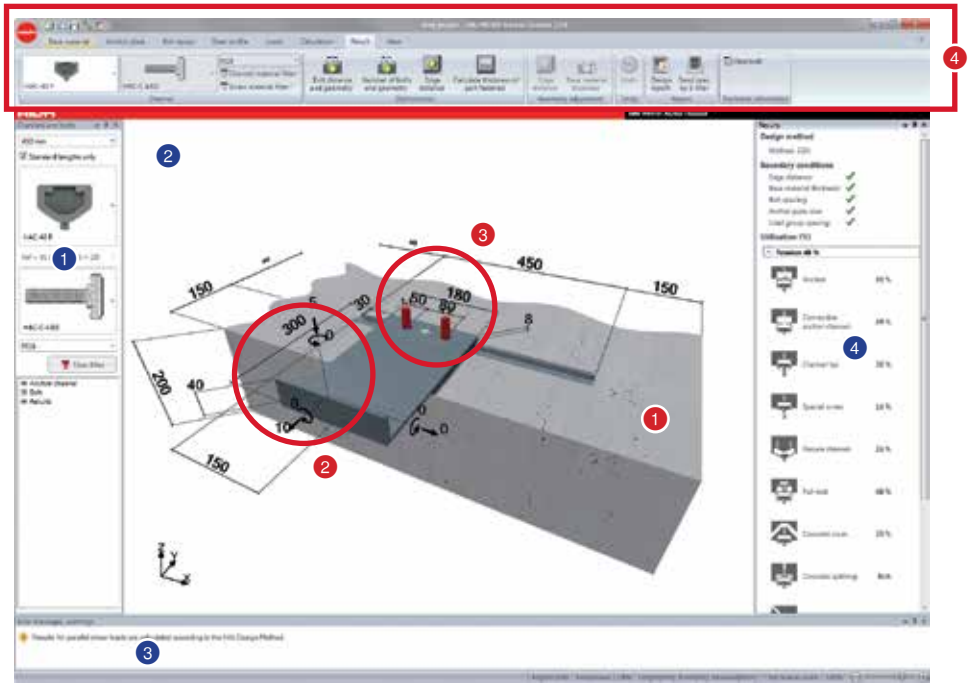
Hilti PROFIS Anchor Channel – the design software for accurate, reliable planning.

Easy-to-use, up-to-date software is essential for the efficient specification of anchor channels. Hilti PROFIS Anchor Channel meets these requirements admirably.

Design calculations are based on the latest CEN/TS status and the ETA design provisions listed in ETA 11/006. The software is kept up to date by an automated updating system.

Hilti PROFIS Anchor Channel can be downloaded free of charge from your local Hilti Online website or from www.hilti.com.

1. **Channel and bolt selector**
2. **3D graphics with interactive input of loads and dimensions**
3. **Immediate messages and warnings guide the user toward the optimized design**
4. **Direct indication of the utilization rate in total and per specific failure mode allows optimization of the fastening point**



1 Base material

Concrete
- C12/15 up to C90/105 or customized
- Cracked / uncracked

Reinforcement
- Takes existing reinforcement into account
- Calculates supplementary reinforcement to enhance concrete loading capacity

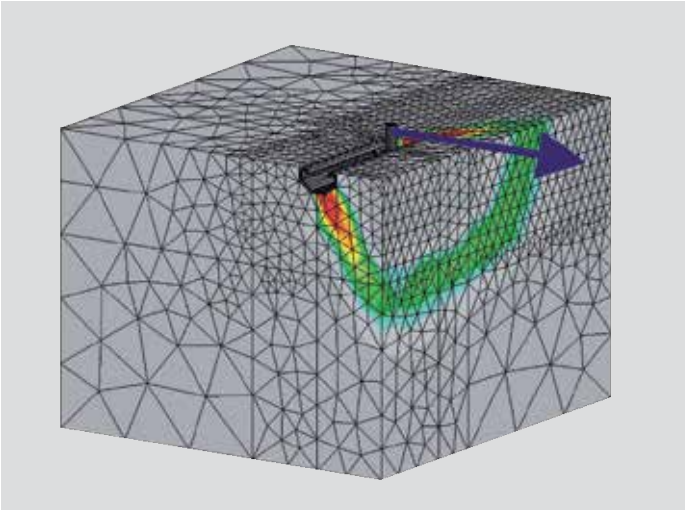
2 Loading
- Static or fatigue loading, calculation of fatigue resistance takes number of load cycles and static pre-loading into account
- Characteristic or design loads
- Calculations for loads occurring in the event of fire

3 Fastening groups
- Up to 8 fastening groups with up to 4 bolts per fastening group
- Each fastening group with loads and moments in 3 directions (x,y and z axis)
- Different types of base plates and predefined brackets
- Stand-off fastenings

4 Result
- Automated optimization of the fastening point in terms of reduced edge distance, bolt size, number of bolts and bolt spacing
- Automated correction in case edge distance and slab thickness exceed the minimum values
- PDF file containing the results in detailed or in brief form, detailed report for easy-to-follow verification including formulas

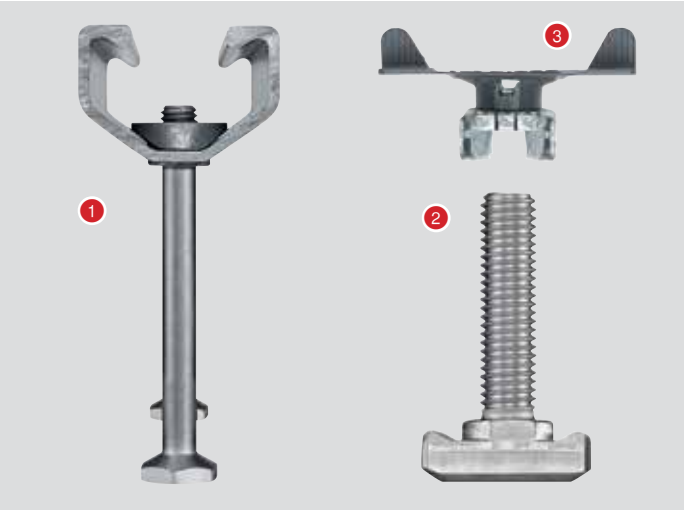
The 3 main advantages of the new anchor channel system.

Innovative V-form for high performance.



The classic anchor channel cross section has been optimized with the aid of advanced computer simulation and through intensive testing. The resulting innovative V-form takes up high loads and allows small edge distances at edge zones where shear loads occur.

Versatile system.



1. Only one anchor channel type for static and fatigue loads as well as loads occurring in the event of fire.
2. Only three different bolt types are needed to cover the entire range of anchor channels.
3. The HAC-30 channels are compatible with the familiar Hilti MQ channel system for general installation work. Installation system parts can thus be mounted directly on the anchor channels without need for elaborate and costly adapters.

Time-saving and well sealed.

The new environmentally friendly LDPE closed-cell foam filling equipped with a tear-out strip can be removed quickly, thus saving labor costs. Plastic end caps also help keep concrete slurry out of the channels.

Overview of minimum geometric boundary conditions.

	Anchor channel spacings					Concrete member dimensions		
	min c_{1i}	min c_{2i}	min e_{2i}	min c_p	min c_s*	min h	min b	min l
				①		②		③
HAC-30	50	50	25	100	50	70 + c	100	50 + $l_{channel}$
HAC-40	50	50	25	100	50	94 + c	100	50 + $l_{channel}$
HAC-50	75	75	50	150	100	110 + c	150	100 + $l_{channel}$
HAC-60	100	100	75	200	150	153 + c	200	150 + $l_{channel}$
HAC-70	100	100	75	200	150	180 + c	200	150 + $l_{channel}$

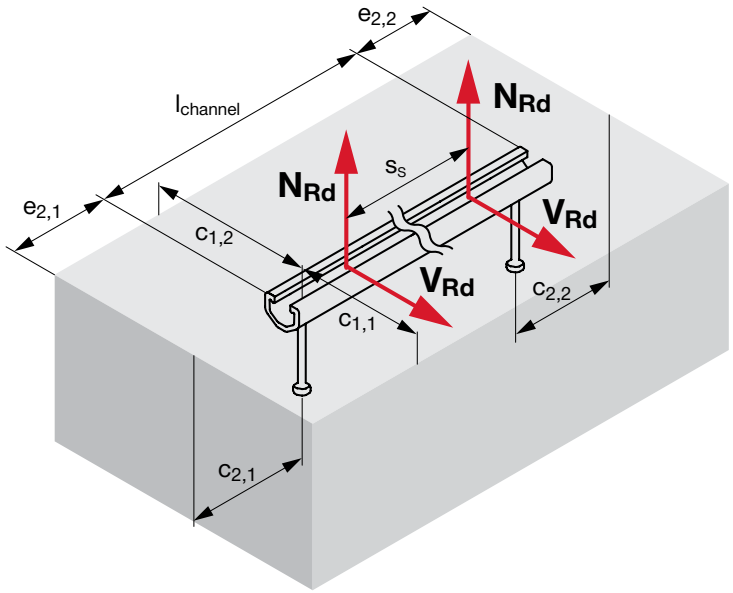
① **Also for channel pairs**

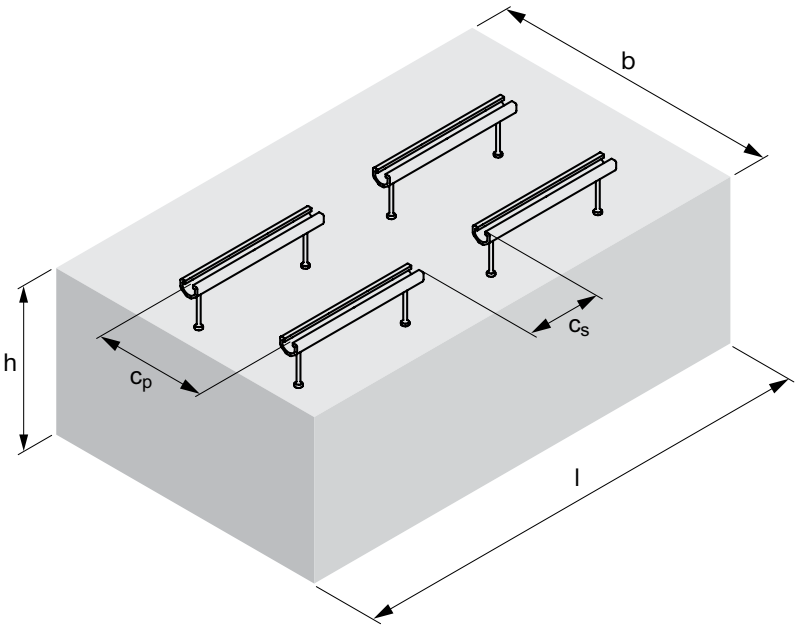
② **c = concrete cover according to DIN EN 1992-1-1:2011-01 (EN 1992)**

③ **$l_{channel}$ = total channel length**

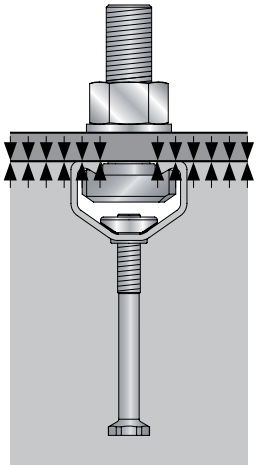
Minimum distance and minimum dimensions in mm.

* Please contact Hilti for information on further reduced spacing.

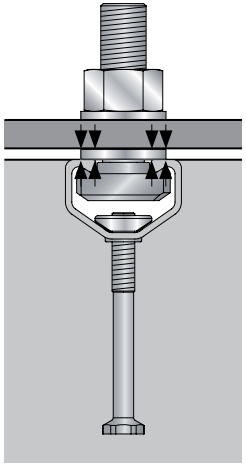




Select the required installation torque according to the base material.



Standard situation
The fixture is in contact with the concrete, the anchor channel or, respectively, the concrete and the anchor channel.



Steel to steel contact
The fixture is fastened to the anchor channel by way of a suitable washer.

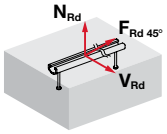
The given torque is to be applied but must not be exceeded.

Anchor channel	Bolt type	Bolt diameter	Min spacing $s_{min,s}$ of the bolt	Setting torque T_{inst}		
				Standard	Steel – steel contact	
				4.6; 8.8; A4-50	4.6; A4-50	8.8
		[mm]	[mm]	[Nm]		
HAC-30	HBC-B	8	40	8	8	–
		10	50	15	15	–
		12	60	30	25	–
HAC-40	HBC-C HBC-C-E HBC-C-N	10	50	15	15	48
		12	60	25	25	70
		16	80	60	120	200
		20	100	75	75	400
HAC-50		10	50	15	15	48
		12	60	25	25	70
		16	80	60	60	200
		20	100	120	120	400
HAC-60		10	50	15	15	48
		12	60	25	25	70
		16	80	60	60	200
		20	100	120	120	400
HAC-70		10	50	15	15	48
		12	60	25	25	70
		16	80	60	60	200
		20	100	120	120	400

Anchor channel design in 9 easy steps starting with loading.

Example: HAC-40 anchor channel

1. **Load type: single load / pair load** (single load)
2. **Concrete grade** (C25/30)
3. **Load direction** (normal force N)
4. **Member thickness** (h = 350mm)
5. **Anchor spacing** (s = 200mm)
6. **Edge distance** ($c_{1,1}$ = 75mm)
7. **Design load** (N_{Rd} = 13.9kN in cracked concrete)
8. **Choose channel length according to your application** (250; 450)
9. **Check bolt capacity**



C25/30 concrete grade

Design resistance [kN]

N_{Rd}	Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 105	150	200	350	≥500	Anchor spacing [mm]
	50	13.4 (13.9)	13.4 (13.9)	13.4 (13.9)	13.4 (13.9)	13.4 (13.9)	
	75	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	100	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	100
	≥150	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	50	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	75	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	100	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	150
	≥150	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	50	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	75	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	100	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	200
	≥150	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	50	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	
	75	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	
	100	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	250
	≥150	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	

The calculations shown in this design aid are based on the following assumptions

- No influence of corners if minimum requirements for corner distance $c_{2,1}$ - $c_{2,2}$ per channel are met
- Arbitrary position of the load between the outer anchors
- For load pairs: Minimum spacing of the bolts according to table - all spacings greater than the specified spacing are safe
- Reinforcement closely spaced
- Straight edge reinforcement
- No supplementary reinforcement
- 100% utilization rate
- No bolt failure

This design aid provides exact values based on given parameters according to ETA 11/0006 February 28, 2012 and CEN TS 1992-4 May 2009.
For exact calculation with different parameters please use our PROFIS Anchor Channel design software which can be downloaded free of charge from http://www.hilti.com.

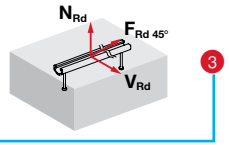
Channel length [mm]	Anchor spacing [mm]	Number of anchors [pcs]	
150	100	2	
200	150	2	
250	200	2	
300	250	2	
350	150	3	
450	200	3	
550	250	3	
800	250	4	
1050	250	5	
1300	250	6	
1550	250	7	
1800	250	8	
2050	250	9	
2300	250	10	
5800	250	24	

Other anchor channel lengths on request.

Anchor channel design in 9 easy steps starting with channel length.

Channel length [mm]	Anchor spacing [mm]	Number of anchors [pcs]
150	100	2
200	150	2
250	200	2
300	250	2
350	150	3
450	200	3
550	250	3
800	250	4
1050	250	5
1300	250	6
1550	250	7
1800	250	8
2050	250	9
2300	250	10
5800	250	24

Other anchor channel lengths on request.



C25/30 concrete grade

Design resistance [kN]

N_{Rd}	Member thickness h [mm] 105	150	200	350	≥500	Anchor spacing [mm]
Edge distance $c_{1,1}$ [mm] 50	13.4 (13.9)	13.4 (13.9)	13.4 (13.9)	13.4 (13.9)	13.4 (13.9)	100
75	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
100	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
≥150	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
50	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	150
75	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
100	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
≥150	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
50	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	200
75	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
100	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
≥150	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
50	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	250
75	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	
100	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	
≥150	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	

Bolt rating/sizes – choose the appropriate bolt

HBC-C [kN]		$N_{Rd.s}$	$V_{Rd.s}$	$F_{Rd.s.45°}$
M10	4.6	11.60	8.32	10.09
	A4-50	10.14	7.31	8.87
M12	4.6	16.85	12.10	14.70
	A4-50	14.74	10.63	12.89
M16	4.6	31.34	22.51	27.36
	8.8	83.57	50.16	66.24
	A4-50	27.42	19.75	23.89
M20	4.6	49.00	35.21	42.66
	8.8	130.67	78.32	103.48
	A4-50	42.83	30.84	37.32

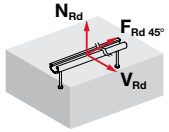
With individual fastening points the acting force must be lower than the applicable resistance of the channel and bolt.
With load pairs the acting force is distributed over 2 bolts.

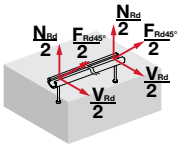
$(N, V, F_{45°})_{Ed} \leq \min [(N, V, F_{45°})_{Rd}; (N_s, V_s, F_{s,45°})_{Rd}]$

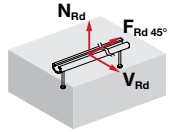
Example: HAC-40 anchor channel

1. **Choose channel length according to your application** (250)
2. **Anchor spacing** (200)
3. **Load type: single load / pair load** (single load)
4. **Concrete grade** (C25/30)
5. **Load direction** (normal force N)
6. **Member thickness** (h = 350mm)
7. **Edge distance** ($c_{1,1}$ = 75mm)
8. **Design load anchor channel** (N_{Rd} = 13.9kN in cracked concrete)
9. **Check bolt capacity**

HAC-30 design tables







C25/30 concrete grade

Design resistance [kN]

N_{Rd}	Member thickness h [mm]										Anchor spacing [mm]
	80		100		150		200		≥350		
Edge distance $c_{1,1}$ [mm]	-	- -	-	- -	-	- -	-	- -	-	- -	-
	-	- -	-	- -	-	- -	-	- -	-	- -	
	-	- -	-	- -	-	- -	-	- -	-	- -	
	-	- -	-	- -	-	- -	-	- -	-	- -	
	50	8.7 (11.1)	8.7	(11.1)	8.7	(11.1)	8.7	(11.1)	8.7	(11.1)	150
	75	10.7 (11.1)	10.7	(11.1)	10.7	(11.1)	10.7	(11.1)	10.7	(11.1)	
	100	11.1 (11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	
	≥150	11.1 (11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	
	50	8.8 (11.1)	8.8	(11.1)	8.8	(11.1)	8.8	(11.1)	8.8	(11.1)	200
	75	10.8 (11.1)	10.8	(11.1)	10.8	(11.1)	10.8	(11.1)	10.8	(11.1)	
	100	11.1 (11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	
	≥150	11.1 (11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	
	50	8.7 (10.5)	8.7	(10.5)	8.7	(10.5)	8.7	(10.5)	8.7	(10.5)	250
	75	10.5 (10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
	100	10.5 (10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
	≥150	10.5 (10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	

s_s ≥ 75 mm Total design resistance [kN]

N_{Rd}	Member thickness h [mm]										Anchor spacing [mm]
	80		100		150		200		≥350		
Edge distance $c_{1,1}$ [mm]	-	- -	-	- -	-	- -	-	- -	-	- -	-
	-	- -	-	- -	-	- -	-	- -	-	- -	
	-	- -	-	- -	-	- -	-	- -	-	- -	
	-	- -	-	- -	-	- -	-	- -	-	- -	
	50	9.4 (13.2)	9.4	(13.2)	9.4	(13.2)	9.4	(13.2)	9.4	(13.2)	150
	75	11.5 (16.2)	11.5	(16.2)	11.5	(16.2)	11.5	(16.2)	11.5	(16.2)	
	100	13.4 (16.5)	13.4	(16.5)	13.4	(16.5)	13.4	(16.5)	13.4	(16.5)	
	≥150	16.4 (16.5)	16.4	(16.5)	16.4	(16.5)	16.4	(16.5)	16.4	(16.5)	
	50	9.7 (13.6)	9.7	(13.6)	9.7	(13.6)	9.7	(13.6)	9.7	(13.6)	200
	75	11.9 (15.1)	11.9	(15.1)	11.9	(15.1)	11.9	(15.1)	11.9	(15.1)	
	100	13.7 (15.1)	13.7	(15.1)	13.7	(15.1)	13.7	(15.1)	13.7	(15.1)	
	≥150	15.1 (15.1)	15.1	(15.1)	15.1	(15.1)	15.1	(15.1)	15.1	(15.1)	
	50	9.7 (13.5)	9.7	(13.5)	9.7	(13.5)	9.7	(13.5)	9.7	(13.5)	250
	75	11.8 (14.0)	11.8	(14.0)	11.8	(14.0)	11.8	(14.0)	11.8	(14.0)	
	100	13.6 (14.0)	13.6	(14.0)	13.6	(14.0)	13.6	(14.0)	13.6	(14.0)	
	≥150	14.0 (14.0)	14.0	(14.0)	14.0	(14.0)	14.0	(14.0)	14.0	(14.0)	

Design resistance [kN]

V_{Rd}	Member thickness h [mm]										Anchor spacing [mm]
	80		100		150		200		≥350		
Edge distance $c_{1,1}$ [mm]	-	- -	-	- -	-	- -	-	- -	-	- -	-
	-	- -	-	- -	-	- -	-	- -	-	- -	
	-	- -	-	- -	-	- -	-	- -	-	- -	
	-	- -	-	- -	-	- -	-	- -	-	- -	
	50	4.9 (5.7)	5.5	(6.4)	6.7	(7.9)	6.8	(7.9)	6.8	(7.9)	150
	75	7.4 (8.7)	8.3	(9.7)	10.1	(10.5)	10.5	(10.5)	10.5	(10.5)	
	100	9.9 (10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
	≥150	10.5 (10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
	50	5.0 (5.8)	5.5	(6.5)	6.8	(8.0)	6.8	(8.0)	6.8	(8.0)	200
	75	7.5 (8.7)	8.4	(9.8)	10.3	(10.5)	10.5	(10.5)	10.5	(10.5)	
	100	10.0 (10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
	≥150	10.5 (10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
	50	4.9 (5.7)	5.5	(6.3)	6.7	(7.8)	6.7	(7.8)	6.7	(7.8)	250
	75	7.5 (8.7)	8.3	(9.7)	10.2	(10.5)	10.5	(10.5)	10.5	(10.5)	
	100	10.0 (10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
	≥150	10.5 (10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	

s_s ≥ 75 mm Total design resistance [kN]

V_{Rd}	Member thickness h [mm]										Anchor spacing [mm]
	80		100		150		200		≥350		
Edge distance $c_{1,1}$ [mm]	-	- -	-	- -	-	- -	-	- -	-	- -	-
	-	- -	-	- -	-	- -	-	- -	-	- -	
	-	- -	-	- -	-	- -	-	- -	-	- -	
	-	- -	-	- -	-	- -	-	- -	-	- -	
	50	5.4 (6.3)	6.0	(7.0)	7.4	(8.6)	7.4	(8.6)	7.4	(8.6)	150
	75	7.9 (9.2)	8.9	(10.3)	10.8	(12.6)	12.5	(14.6)	12.6	(14.7)	
	100	10.4 (12.2)	11.6	(13.6)	14.2	(16.6)	16.4	(19.2)	18.4	(21.1)	
	≥150	15.3 (17.8)	17.1	(20.0)	21.0	(21.1)	21.1	(21.1)	21.1	(21.1)	
	50	5.5 (6.4)	6.2	(7.2)	7.6	(8.8)	7.6	(8.9)	7.6	(8.9)	200
	75	8.1 (9.5)	9.1	(10.6)	11.1	(13.0)	12.8	(15.0)	12.9	(15.0)	
	100	10.6 (12.4)	11.9	(13.9)	14.5	(17.0)	16.9	(19.7)	18.8	(21.1)	
	≥150	15.6 (18.2)	17.4	(20.3)	21.1	(21.1)	21.1	(21.1)	21.1	(21.1)	
	50	5.5 (6.4)	6.1	(7.1)	7.5	(8.7)	7.5	(8.7)	7.5	(8.7)	250
	75	8.1 (9.5)	9.1	(10.6)	11.1	(13.0)	12.8	(15.0)	12.9	(15.0)	
	100	10.7 (12.5)	11.9	(13.9)	14.7	(17.1)	16.9	(19.7)	18.9	(21.1)	
	≥150	15.6 (18.3)	17.5	(20.4)	21.1	(21.1)	21.1	(21.1)	21.1	(21.1)	

Design resistance [kN]

$F_{Rd\ 45°}$	Member thickness h [mm]										Anchor spacing [mm]
	80		100		150		200		≥350		
Edge distance $c_{1,1}$ [mm]	-	- -	-	- -	-	- -	-	- -	-	- -	-
	-	- -	-	- -	-	- -	-	- -	-	- -	
	-	- -	-	- -	-	- -	-	- -	-	- -	
	-	- -	-	- -	-	- -	-	- -	-	- -	
	50	5.5 (6.7)	5.9	(7.3)	6.7	(8.4)	6.8	(8.4)	6.8	(8.4)	150
	75	7.7 (9.4)	8.3	(10.2)	9.3	(10.8)	10.0	(10.8)	10.0	(10.8)	
	100	9.7 (10.8)	10.4	(10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	
	≥150	10.8 (10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	
	50	5.6 (6.8)	6.0	(7.4)	6.8	(8.5)	6.8	(8.5)	6.8	(8.5)	200
	75	7.8 (9.3)	8.4	(10.0)	9.4	(10.8)	10.1	(10.8)	10.1	(10.8)	
	100	9.9 (10.8)	10.5	(10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	
	≥150	10.8 (10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	
	50	5.4 (6.7)	5.9	(7.3)	6.7	(8.4)	6.7	(8.4)	6.7	(8.4)	250
	75	7.8 (9.0)	8.3	(9.7)	9.3	(10.5)	10.0	(10.5)	10.0	(10.5)	
	100	9.8 (10.5)	10.4	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
	≥150	10.5 (10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	

s_s ≥ 75 mm Total design resistance [kN]

$F_{Rd\ 45°}$	Member thickness h [mm]										Anchor spacing [mm]
	80		100		150		200		≥350		
Edge distance $c_{1,1}$ [mm]	-	- -	-	- -	-	- -	-	- -	-	- -	-
	-	- -	-	- -	-	- -	-	- -	-	- -	
	-	- -	-	- -	-	- -	-	- -	-	- -	
	-	- -	-	- -	-	- -	-	- -	-	- -	
	50	6.0 (7.4)	6.5	(8.0)	7.4	(9.2)	7.4	(9.2)	7.4	(9.2)	150
	75	8.3 (10.3)	8.9	(11.1)	10.0	(12.6)	10.7	(13.7)	10.7	(13.7)	
	100	10.4 (12.4)	11.1	(13.3)	12.3	(14.8)	13.1	(15.8)	13.7	(16.6)	
	≥150	14.1 (15.3)	14.9	(16.1)	16.3	(17.4)	17.2	(18.3)	18.8	(19.7)	
	50	6.2 (7.5)	6.6	(8.2)	7.5	(9.4)	7.6	(9.4)	7.6	(9.4)	200
	75	8.5 (10.3)	9.1	(11.0)	10.3	(12.5)	11.0	(13.4)	11.0	(13.4)	
	100	10.6 (12.1)	11.3	(12.9)	12.6	(14.3)	13.4	(15.2)	14.0	(15.9)	
	≥150	13.7 (14.7)	14.4	(15.4)	15.7	(16.5)	16.5	(17.3)	17.8	(18.4)	
	50	6.1 (7.5)	6.6	(8.1)	7.5	(9.3)	7.5	(9.3)	7.5	(9.3)	250
	75	8.5 (10.0)	9.1	(10.7)	10.2	(12.0)	11.0	(12.9)	11.0	(12.9)	
	100	10.6 (11.8)	11.3	(12.5)	12.6	(13.7)	13.4	(14.5)	14.0	(15.1)	
	≥150	13.2 (14.1)	13.8	(14.7)	15.0	(15.7)	15.6	(16.3)	16.9	(16.9)	

() values in parenthesis for uncracked concrete

C30/37 concrete grade

Design resistance [kN]

N_{Rd}	Member thickness h [mm]										Anchor spacing [mm]
	80		100		150		200		≥350		
Edge distance $c_{1,1}$ [mm]	-	- -	-	- -	-	- -	-	- -	-	- -	-
	-	- -	-	- -	-	- -	-	- -	-	- -	
	-	- -	-	- -	-	- -	-	- -	-	- -	
	-	- -	-	- -	-	- -	-	- -	-	- -	
	50	9.7 (11.1)	9.7	(11.1)	9.7	(11.1)	9.7	(11.1)	9.7	(11.1)	150
	75	11.1 (11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	
	100	11.1 (11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	
	≥ 150	11.1 (11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	
	50	9.8 (11.1)	9.8	(11.1)	9.8	(11.1)	9.8	(11.1)	9.8	(11.1)	200
	75	11.1 (11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	
	100	11.1 (11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	
	≥ 150	11.1 (11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	
	50	9.7 (10.5)	9.7	(10.5)	9.7	(10.5)	9.7	(10.5)	9.7	(10.5)	250
	75	10.5 (10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
	100	10.5 (10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
	≥ 150	10.5 (10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	

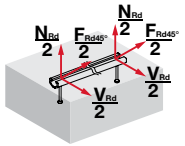
Design resistance [kN]

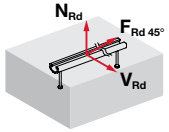
V_{Rd}	Member thickness h [mm]										Anchor spacing [mm]
	80		100		150		200		≥350		
Edge distance $c_{1,1}$ [mm]	-	- -	-	- -	-	- -	-	- -	-	- -	-
	-	- -	-	- -	-	- -	-	- -	-	- -	
	-	- -	-	- -	-	- -	-	- -	-	- -	
	-	- -	-	- -	-	- -	-	- -	-	- -	
	50	5.5 (6.4)	6.1	(7.1)	7.5	(8.7)	7.5	(8.7)	7.5	(8.7)	150
	75	8.3 (9.6)	9.2	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
	100	10.5 (10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
	≥ 150	10.5 (10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
	50	5.5 (6.4)	6.2	(7.2)	7.6	(8.8)	7.6	(8.9)	7.6	(8.9)	200
	75	8.3 (9.7)	9.3	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
	100	10.5 (10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
	≥ 150	10.5 (10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
	50	5.4 (6.3)	6.0	(7.0)	7.4	(8.6)	7.4	(8.7)	7.4	(8.7)	250
	75	8.3 (9.7)	9.2	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
	100	10.5 (10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
	≥ 150	10.5 (10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	

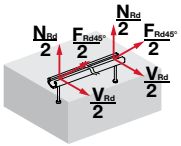
Design resistance [kN]

$F_{Rd\ 45°}$	Member thickness h [mm]										Anchor spacing [mm]
	80		100		150		200		≥350		
Edge distance $c_{1,1}$ [mm]	-	- -	-	- -	-	- -	-	- -	-	- -	-
	-	- -	-	- -	-	- -	-	- -	-	- -	
	-	- -	-	- -	-	- -	-	- -	-	- -	
	-	- -	-	- -	-	- -	-	- -	-	- -	
	50	6.1 (7.5)	6.6	(8.1)	7.5	(9.3)	7.5	(9.4)	7.5	(9.4)	150
	75	8.6 (10.1)	9.2	(10.8)	10.3	(10.8)	10.8	(10.8)	10.8	(10.8)	
	100	10.8 (10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	
	≥ 150	10.8 (10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	
	50	6.2 (7.5)	6.7	(8.1)	7.6	(9.3)	7.6	(9.4)	7.6	(9.4)	200
	75	8.7 (10.0)	9.3	(10.6)	10.4	(10.8)	10.8	(10.8)	10.8	(10.8)	
	100	10.7 (10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	
	≥ 150	10.8 (10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	
	50	6.1 (7.3)	6.5	(7.9)	7.4	(9.0)	7.5	(9.0)	7.5	(9.0)	250
	75	8.6 (9.7)	9.2	(10.3)	10.3	(10.5)	10.5	(10.5)	10.5	(10.5)	
	100	10.4 (10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
	≥ 150	10.5 (10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	

() values in parenthesis for uncracked concrete







C50/60 concrete grade

$s_s \geq 75$ mm — Total design resistance [kN]

N_{Rd}	Member thickness h [mm]										Anchor spacing [mm]
Edge distance $c_{1,1}$ [mm]	80		100		150		200		≥350		
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	
50	10.5	(14.7)	10.5	(14.7)	10.5	(14.7)	10.5	(14.7)	10.5	(14.7)	150
75	12.8	(16.5)	12.8	(16.5)	12.8	(16.5)	12.8	(16.5)	12.8	(16.5)	
100	14.8	(16.5)	14.8	(16.5)	14.8	(16.5)	14.8	(16.5)	14.8	(16.5)	
≥ 150	16.5	(16.5)	16.5	(16.5)	16.5	(16.5)	16.5	(16.5)	16.5	(16.5)	
50	10.8	(15.1)	10.8	(15.1)	10.8	(15.1)	10.8	(15.1)	10.8	(15.1)	200
75	13.2	(15.1)	13.2	(15.1)	13.2	(15.1)	13.2	(15.1)	13.2	(15.1)	
100	15.1	(15.1)	15.1	(15.1)	15.1	(15.1)	15.1	(15.1)	15.1	(15.1)	
≥ 150	15.1	(15.1)	15.1	(15.1)	15.1	(15.1)	15.1	(15.1)	15.1	(15.1)	
50	10.7	(14.0)	10.7	(14.0)	10.7	(14.0)	10.7	(14.0)	10.7	(14.0)	250
75	13.1	(14.0)	13.1	(14.0)	13.1	(14.0)	13.1	(14.0)	13.1	(14.0)	
100	14.0	(14.0)	14.0	(14.0)	14.0	(14.0)	14.0	(14.0)	14.0	(14.0)	
≥ 150	14.0	(14.0)	14.0	(14.0)	14.0	(14.0)	14.0	(14.0)	14.0	(14.0)	

Design resistance [kN]

N_{Rd}	Member thickness h [mm]										Anchor spacing [mm]
Edge distance $c_{1,1}$ [mm]	80		100		150		200		≥350		
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	
50	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	150
75	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	
100	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	
≥150	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	
50	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	200
75	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	
100	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	
≥150	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	11.1	(11.1)	
50	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	250
75	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
100	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
≥150	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	

$s_s \geq 60$ mm — Total design resistance [kN]

N_{Rd}	Member thickness h [mm]										Anchor spacing [mm]
Edge distance $c_{1,1}$ [mm]	80		100		150		200		≥350		
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	
50	13.4	(16.5)	13.4	(16.5)	13.4	(16.5)	13.4	(16.5)	13.4	(16.5)	150
75	16.4	(16.5)	16.4	(16.5)	16.4	(16.5)	16.4	(16.5)	16.4	(16.5)	
100	16.5	(16.5)	16.5	(16.5)	16.5	(16.5)	16.5	(16.5)	16.5	(16.5)	
≥150	16.5	(16.5)	16.5	(16.5)	16.5	(16.5)	16.5	(16.5)	16.5	(16.5)	
50	13.7	(15.1)	13.7	(15.1)	13.7	(15.1)	13.7	(15.1)	13.7	(15.1)	200
75	15.1	(15.1)	15.1	(15.1)	15.1	(15.1)	15.1	(15.1)	15.1	(15.1)	
100	15.1	(15.1)	15.1	(15.1)	15.1	(15.1)	15.1	(15.1)	15.1	(15.1)	
≥150	15.1	(15.1)	15.1	(15.1)	15.1	(15.1)	15.1	(15.1)	15.1	(15.1)	
50	13.6	(14.0)	13.6	(14.0)	13.6	(14.0)	13.6	(14.0)	13.6	(14.0)	250
75	14.0	(14.0)	14.0	(14.0)	14.0	(14.0)	14.0	(14.0)	14.0	(14.0)	
100	14.0	(14.0)	14.0	(14.0)	14.0	(14.0)	14.0	(14.0)	14.0	(14.0)	
≥150	14.0	(14.0)	14.0	(14.0)	14.0	(14.0)	14.0	(14.0)	14.0	(14.0)	

$s_s \geq 75$ mm — Total design resistance [kN]

V_{Rd}	Member thickness h [mm]										Anchor spacing [mm]
Edge distance $c_{1,1}$ [mm]	80		100		150		200		≥350		
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	
50	6.0	(7.0)	6.7	(7.8)	8.2	(9.5)	8.2	(9.6)	8.2	(9.6)	150
75	8.8	(10.3)	9.8	(11.5)	12.0	(14.0)	13.9	(16.2)	13.9	(16.2)	
100	11.5	(13.4)	12.9	(15.0)	15.8	(18.4)	18.3	(21.1)	20.5	(21.1)	
≥ 150	17.0	(19.8)	19.0	(21.1)	21.1	(21.1)	21.1	(21.1)	21.1	(21.1)	
50	6.1	(7.2)	6.9	(8.0)	8.4	(9.8)	8.4	(9.8)	8.4	(9.8)	200
75	9.0	(10.5)	10.1	(11.8)	12.3	(14.4)	14.3	(16.6)	14.3	(16.7)	
100	11.8	(13.8)	13.2	(15.4)	16.2	(18.9)	18.7	(21.1)	20.9	(21.1)	
≥ 150	17.3	(20.1)	19.3	(21.1)	21.1	(21.1)	21.1	(21.1)	21.1	(21.1)	
50	6.0	(7.0)	6.8	(7.9)	8.3	(9.7)	8.3	(9.7)	8.3	(9.7)	250
75	9.0	(10.5)	10.1	(11.8)	12.3	(14.4)	14.3	(16.7)	14.3	(16.7)	
100	11.9	(13.9)	13.3	(15.5)	16.2	(18.9)	18.8	(21.1)	21.0	(21.1)	
≥ 150	17.3	(20.3)	19.4	(21.1)	21.1	(21.1)	21.1	(21.1)	21.1	(21.1)	

Design resistance [kN]

V_{Rd}	Member thickness h [mm]										Anchor spacing [mm]
Edge distance $c_{1,1}$ [mm]	80		100		150		200		≥350		
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	
50	6.9	(8.1)	7.8	(9.1)	9.5	(10.5)	9.6	(10.5)	9.6	(10.5)	150
75	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
100	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
≥150	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
50	7.0	(8.2)	7.9	(9.2)	9.6	(10.5)	9.7	(10.5)	9.7	(10.5)	200
75	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
100	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
≥150	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
50	6.9	(8.0)	7.7	(9.0)	9.4	(10.5)	9.5	(10.5)	9.5	(10.5)	250
75	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
100	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
≥150	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	

$s_s \geq 60$ mm — Total design resistance [kN]

V_{Rd}	Member thickness h [mm]										Anchor spacing [mm]
Edge distance $c_{1,1}$ [mm]	80		100		150		200		≥350		
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	
50	7.6	(8.9)	8.5	(9.9)	10.4	(12.2)	10.5	(12.2)	10.5	(12.2)	150
75	11.2	(13.1)	12.5	(14.6)	15.3	(17.9)	17.7	(20.6)	17.8	(20.8)	
100	14.7	(17.2)	16.4	(19.2)	20.1	(21.1)	21.1	(21.1)	21.1	(21.1)	
≥150	21.1	(21.1)	21.1	(21.1)	21.1	(21.1)	21.1	(21.1)	21.1	(21.1)	
50	7.8	(9.1)	8.7	(10.2)	10.7	(12.5)	10.8	(12.5)	10.8	(12.5)	200
75	11.5	(13.4)	12.8	(15.0)	15.8	(18.3)	18.2	(21.1)	18.2	(21.1)	
100	15.0	(17.6)	16.9	(19.7)	20.6	(21.1)	21.1	(21.1)	21.1	(21.1)	
≥150	21.1	(21.1)	21.1	(21.1)	21.1	(21.1)	21.1	(21.1)	21.1	(21.1)	
50	7.7	(9.0)	8.6	(10.0)	10.5	(12.3)	10.6	(12.3)	10.6	(12.3)	250
75	11.5	(13.4)	12.8	(15.0)	15.8	(18.4)	18.2	(21.1)	18.3	(21.1)	
100	15.1	(17.6)	16.9	(19.7)	20.7	(21.1)	21.1	(21.1)	21.1	(21.1)	
≥150	21.1	(21.1)	21.1	(21.1)	21.1	(21.1)	21.1	(21.1)	21.1	(21.1)	

$s_s \geq 75$ mm — Total design resistance [kN]

$F_{Rd\,45°}$	Member thickness h [mm]										Anchor spacing [mm]
Edge distance $c_{1,1}$ [mm]	80		100		150		200		≥350		
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	
50	6.7	(8.2)	7.2	(8.9)	8.2	(10.2)	8.2	(10.2)	8.2	(10.2)	150
75	9.2	(11.1)	9.9	(12.0)	11.1	(13.5)	11.9	(14.6)	11.9	(14.6)	
100	11.5	(13.2)	12.3	(14.0)	13.7	(15.6)	14.6	(16.5)	15.2	(17.3)	
≥ 150	15.0	(16.0)	15.7	(16.8)	17.1	(18.1)	18.0	(18.8)	19.4	(20.1)	
50	6.8	(8.4)	7.4	(9.1)	8.4	(10.5)	8.4	(10.5)	8.4	(10.5)	200
75	9.5	(11.0)	10.1	(11.8)	11.4	(13.1)	12.2	(14.1)	12.2	(14.1)	
100	11.8	(12.8)	12.6	(13.6)	13.9	(15.0)	14.9	(15.8)	15.6	(16.4)	
≥ 150	14.4	(15.3)	15.1	(16.0)	16.2	(17.1)	17.0	(17.7)	18.2	(18.9)	
50	6.8	(8.1)	7.3	(8.8)	8.3	(10.1)	8.3	(10.1)	8.3	(10.1)	250
75	9.5	(10.7)	10.1	(11.4)	11.3	(12.7)	12.2	(13.6)	12.2	(13.6)	
100	11.4	(12.4)	12.2	(13.1)	13.4	(14.3)	14.2	(15.0)	14.9	(15.6)	
≥ 150	13.8	(14.7)	14.4	(15.3)	15.5	(16.2)	16.1	(16.8)	16.9	(16.9)	

Design resistance [kN]

$F_{Rd\,45°}$	Member thickness h [mm]										Anchor spacing [mm]
Edge distance $c_{1,1}$ [mm]	80		100		150		200		≥350		
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	
50	7.8	(9.0)	8.4	(9.7)	9.5	(10.8)	9.6	(10.8)	9.6	(10.8)	150
75	10.7	(10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	
100	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	
≥150	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	
50	7.9	(8.9)	8.5	(9.6)	9.7	(10.8)	9.7	(10.8)	9.7	(10.8)	200
75	10.5	(10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	
100	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	
≥150	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	10.8	(10.8)	
50	7.7	(8.6)	8.3	(9.2)	9.5	(10.4)	9.5	(10.4)	9.5	(10.4)	250
75	10.2	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
100	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	
≥150	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	10.5	(10.5)	

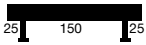
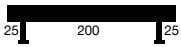
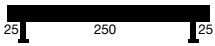
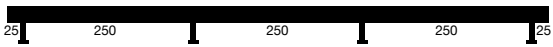
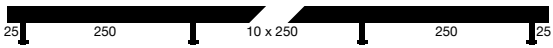
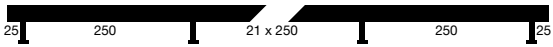
$s_s \geq 60$ mm — Total design resistance [kN]

$F_{Rd\,45°}$	Member thickness h [mm]										Anchor spacing [mm]
Edge distance $c_{1,1}$ [mm]	80		100		150		200		≥350		
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	
-	-	-	-	-	-	-	-	-	-	-	
50	8.5	(10.1)	9.2	(10.9)	10.4	(12.4)	10.4	(12.5)	10.4	(12.5)	150
75	11.8	(13.0)	12.6	(13.8)	14.1	(15.3)	15.2	(16.3)	15.2	(16.3)	
100	13.9	(15.0)	14.7	(15.8)	16.2	(17.2)	17.1	(18.1)	17.8	(18.7)	
≥150	16.6	(17.6)	17.4	(18.3)	18.6	(19.4)	19.3	(20.0)	20.6	(21.3)	
50	8.7	(10.0)	9.4	(10.7)	10.7	(12.2)	10.7	(12.2)	10.7	(12.2)	200
75	11.6	(12.7)	12.4	(13.4)	13.7	(14.8)	14.7	(15.6)	14.7	(15.6)	
100	13.4	(14.5)	14.2	(15.2)	15.5	(16.3)	16.3	(17.1)	16.9	(17.6)	
≥150	15.9	(16.7)	16.5	(17.3)	17.5	(18.1)	18.1	(18.7)	19.4	(20.0)	
50	8.6	(9.7)	9.3	(10.4)	10.6	(11.7)	10.6	(11.7)	10.6	(11.7)	250
75	11.2	(12.2)	12.0	(12.9)	13.2	(14.1)	14.0	(14.9)	14.1	(14.9)	
100	13.0	(13.9)	13.6	(14.5)	14.8	(15.6)	15.5	(16.2)	16.0	(16.7)	
≥150	15.1	(15.9)	15.6	(16.3)	16.5	(16.9)	16.9	(16.9)	16.9	(16.9)	

() values in parenthesis for uncracked concrete

() values in parenthesis for uncracked concrete

() values in parenthesis for uncracked concrete

Channel length [mm]	Anchor spacing [mm]	Number of anchors [pcs]	
200	150	2	
250	200	2	
300	250	2	
550	250	3	
800	250	4	
1050	250	5	
1300	250	6	
1550	250	7	
2050	250	9	
2300	250	10	
3050	250	13	
5800	250	24	

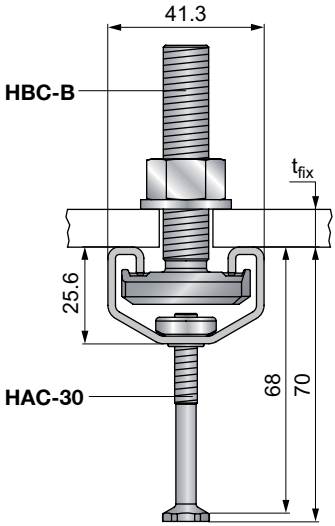
Other anchor channel lengths on request.

Minimum requirements

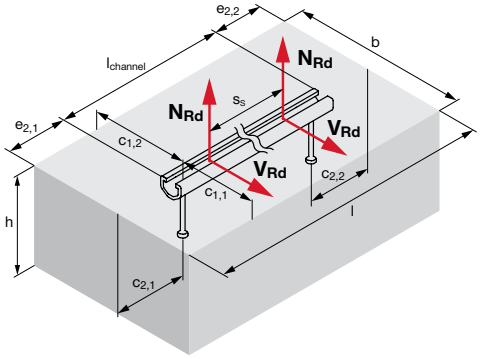
Dimensions	[mm]
$c_{1,i}$	50
h	70 + c
b	100
l	50 + $l_{channel}$
c = concrete cover according to DIN EN 1992-1-1:2005	

Edge distance $c_{1,1}$ [mm] $c_{1,2} \geq c_{1,1}$	Minimum corner distance min $c_{2,1}$; min $c_{2,2}$ [mm]
50	157
75	192
100	242
150	342

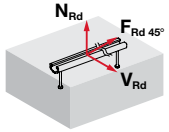
	Bolt length [mm]	Clamping length t_{fix} [mm]
M8	30	11
	50	31
	100	81
M10	40	18
	60	38
	100	78
M12	40	15
	60	35
	80	55
	100	75
	150	125

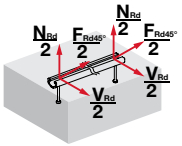


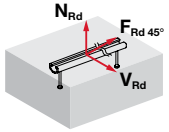
HBC-B [kN]				
		$N_{Rd.s}$	$V_{Rd.s}$	$F_{Rd.s.45°}$
M8	4.6	7.30	4.37	5.78
M10	4.6	11.60	6.95	9.18
M12	4.6	16.85	12.10	14.67



HAC-40 design tables







C25/30 concrete grade

Design resistance [kN]

N_{Rd}	Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 105	150	200	350	≥500	Anchor spacing [mm]
	50	13.4 (13.9)	13.4 (13.9)	13.4 (13.9)	13.4 (13.9)	13.4 (13.9)	100
	75	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	100	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	≥150	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	50	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	150
	75	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	100	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	≥150	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	50	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	200
	75	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	100	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	≥150	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	50	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	250
	75	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	
	100	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	
	≥150	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	

s_s ≥ 80 mm Total design resistance [kN]

N_{Rd}	Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 105	150	200	350	≥500	Anchor spacing [mm]
	50	14.1 (16.7)	14.1 (19.8)	14.1 (19.8)	14.1 (19.8)	14.1 (19.8)	100
	75	17.3 (20.5)	17.3 (24.2)	17.3 (24.2)	17.3 (24.2)	17.3 (24.2)	
	100	20.0 (23.7)	20.0 (26.1)	20.0 (26.1)	20.0 (26.1)	20.0 (26.1)	
	≥150	24.4 (26.1)	24.4 (26.1)	24.4 (26.1)	24.4 (26.1)	24.4 (26.1)	
	50	14.8 (17.6)	14.8 (20.8)	14.8 (20.8)	14.8 (20.8)	14.8 (20.8)	150
	75	18.2 (21.6)	18.2 (23.3)	18.2 (23.3)	18.2 (23.3)	18.2 (23.3)	
	100	21.0 (23.3)	21.0 (23.3)	21.0 (23.3)	21.0 (23.3)	21.0 (23.3)	
	≥150	23.1 (23.3)	23.1 (23.3)	23.1 (23.3)	23.1 (23.3)	23.1 (23.3)	
	50	15.3 (18.2)	15.3 (21.4)	15.3 (21.4)	15.3 (21.4)	15.3 (21.4)	200
	75	18.7 (21.4)	18.7 (21.4)	18.7 (21.4)	18.7 (21.4)	18.7 (21.4)	
	100	21.1 (21.4)	21.1 (21.4)	21.1 (21.4)	21.1 (21.4)	21.1 (21.4)	
	≥150	21.1 (21.4)	21.1 (21.4)	21.1 (21.4)	21.1 (21.4)	21.1 (21.4)	
	50	15.4 (18.3)	15.4 (19.5)	15.4 (19.5)	15.4 (19.5)	15.4 (19.5)	250
	75	18.8 (19.5)	18.8 (19.5)	18.8 (19.5)	18.8 (19.5)	18.8 (19.5)	
	100	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	
	≥150	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	

Design resistance [kN]

V_{Rd}	Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 105	150	200	350	≥500	Anchor spacing [mm]
	50	6.1 (7.1)	7.3 (8.5)	7.4 (8.7)	7.4 (8.7)	7.4 (8.7)	100
	75	9.3 (10.8)	11.1 (13.0)	12.8 (15.0)	13.0 (15.1)	13.0 (15.1)	
	100	12.5 (14.5)	14.9 (17.4)	17.2 (19.4)	19.4 (19.4)	19.4 (19.4)	
	≥150	18.8 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
	50	6.4 (7.4)	7.6 (8.9)	7.8 (9.0)	7.8 (9.0)	7.8 (9.0)	150
	75	9.6 (11.2)	11.5 (13.4)	13.3 (15.5)	13.5 (15.8)	13.5 (15.8)	
	100	12.8 (15.0)	15.4 (18.0)	17.7 (19.4)	19.4 (19.4)	19.4 (19.4)	
	≥150	19.2 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
	50	6.5 (7.5)	7.7 (9.0)	7.9 (9.2)	7.9 (9.2)	7.9 (9.2)	200
	75	9.8 (11.4)	11.7 (13.6)	13.5 (15.8)	13.7 (16.0)	13.7 (16.0)	
	100	13.0 (15.2)	15.6 (18.2)	18.0 (19.4)	19.4 (19.4)	19.4 (19.4)	
	≥150	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
	50	6.3 (7.4)	7.6 (8.8)	7.7 (9.0)	7.7 (9.0)	7.7 (9.0)	250
	75	9.7 (11.3)	11.6 (13.6)	13.4 (15.6)	13.6 (15.9)	13.6 (15.9)	
	100	13.0 (15.1)	15.5 (18.1)	18.0 (19.4)	19.4 (19.4)	19.4 (19.4)	
	≥150	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	

s_s ≥ 80 mm Total design resistance [kN]

V_{Rd}	Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 105	150	200	350	≥500	Anchor spacing [mm]
	50	6.5 (7.6)	7.8 (9.1)	8.0 (9.3)	8.0 (9.3)	8.0 (9.3)	100
	75	9.8 (11.4)	11.7 (13.7)	13.5 (15.8)	13.7 (16.0)	13.7 (16.0)	
	100	13.0 (15.1)	15.5 (18.1)	18.0 (20.9)	20.3 (23.7)	20.3 (23.7)	
	≥150	19.4 (22.6)	23.2 (27.0)	26.7 (31.2)	35.4 (38.8)	35.6 (38.8)	
	50	7.0 (8.2)	8.4 (9.8)	8.6 (10.0)	8.6 (10.0)	8.6 (10.0)	150
	75	10.3 (12.0)	12.3 (14.4)	14.2 (16.6)	14.5 (16.9)	14.5 (16.9)	
	100	13.6 (15.8)	16.2 (18.9)	18.7 (21.9)	21.1 (24.7)	21.1 (24.7)	
	≥150	20.0 (23.3)	23.9 (27.8)	27.6 (32.2)	36.5 (38.8)	36.9 (38.8)	
	50	7.2 (8.4)	8.6 (10.1)	8.8 (10.3)	8.8 (10.3)	8.8 (10.3)	200
	75	10.6 (12.4)	12.7 (14.8)	14.7 (17.1)	14.9 (17.3)	14.9 (17.3)	
	100	13.9 (16.2)	16.6 (19.4)	19.2 (22.3)	21.7 (25.3)	21.7 (25.3)	
	≥150	20.4 (23.7)	24.3 (28.3)	28.1 (32.7)	37.1 (38.8)	37.5 (38.8)	
	50	7.1 (8.3)	8.5 (10.0)	8.7 (10.1)	8.7 (10.1)	8.7 (10.1)	250
	75	10.7 (12.5)	12.8 (14.9)	14.7 (17.2)	14.9 (17.5)	14.9 (17.5)	
	100	14.0 (16.4)	16.7 (19.5)	19.3 (22.6)	21.9 (25.5)	21.9 (25.5)	
	≥150	20.5 (23.9)	24.5 (28.6)	28.3 (33.0)	37.3 (38.8)	37.8 (38.8)	

Design resistance [kN]

$F_{Rd\ 45°}$	Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 105	150	200	350	≥500	Anchor spacing [mm]
	50	7.2 (8.4)	8.2 (10.1)	8.4 (10.2)	8.4 (10.2)	8.4 (10.2)	100
	75	10.4 (12.2)	11.7 (14.1)	12.8 (15.6)	12.9 (15.7)	12.9 (15.7)	
	100	13.3 (15.3)	14.8 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
	≥150	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
	50	7.5 (8.8)	8.6 (10.5)	8.7 (10.7)	8.7 (10.7)	8.7 (10.7)	150
	75	10.8 (12.5)	12.1 (14.1)	13.3 (15.4)	13.4 (15.6)	13.4 (15.6)	
	100	13.7 (15.1)	15.3 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
	≥150	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
	50	7.6 (8.9)	8.7 (10.5)	8.8 (10.6)	8.8 (10.6)	8.8 (10.6)	200
	75	10.9 (12.4)	12.3 (13.9)	13.4 (15.2)	13.6 (15.3)	13.6 (15.3)	
	100	13.5 (14.9)	15.0 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
	≥150	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
	50	7.5 (8.8)	8.6 (10.2)	8.7 (10.3)	8.7 (10.3)	8.7 (10.3)	250
	75	10.9 (12.1)	12.2 (13.6)	13.4 (14.7)	13.5 (14.8)	13.5 (14.8)	
	100	13.1 (14.4)	14.6 (15.9)	15.7 (15.9)	15.9 (15.9)	15.9 (15.9)	
	≥150	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	

s_s ≥ 80 mm Total design resistance [kN]

$F_{Rd\ 45°}$	Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 105	150	200	350	≥500	Anchor spacing [mm]
	50	7.7 (9.0)	8.8 (10.8)	8.9 (10.9)	8.9 (10.9)	8.9 (10.9)	100
	75	10.9 (12.8)	12.3 (15.3)	13.5 (16.9)	13.6 (17.0)	13.6 (17.0)	
	100	13.9 (16.3)	15.5 (18.9)	16.9 (20.6)	17.9 (22.1)	17.9 (22.1)	
	≥150	19.2 (21.6)	21.2 (23.7)	22.8 (25.3)	25.6 (28.1)	25.6 (28.2)	
	50	8.2 (9.7)	9.4 (11.5)	9.5 (11.7)	9.5 (11.7)	9.5 (11.7)	150
	75	11.5 (13.5)	13.0 (15.6)	14.2 (17.2)	14.3 (17.4)	14.3 (17.4)	
	100	14.5 (16.7)	16.2 (18.6)	17.6 (20.1)	18.8 (21.4)	18.8 (21.4)	
	≥150	19.0 (20.8)	20.9 (22.6)	22.3 (24.0)	24.9 (26.3)	25.0 (26.4)	
	50	8.5 (9.9)	9.7 (11.8)	9.8 (12.0)	9.8 (12.0)	9.8 (12.0)	200
	75	11.8 (13.7)	13.4 (15.5)	14.6 (16.9)	14.7 (17.0)	14.7 (17.0)	
	100	14.8 (16.4)	16.5 (18.1)	17.9 (19.5)	19.1 (20.6)	19.1 (20.6)	
	≥150	18.5 (20.0)	20.1 (21.6)	21.4 (22.8)	23.6 (24.8)	23.6 (24.9)	
	50	8.4 (9.9)	9.6 (11.5)	9.7 (11.7)	9.7 (11.7)	9.7 (11.7)	250
	75	11.9 (13.4)	13.4 (15.1)	14.7 (16.4)	14.8 (16.5)	14.8 (16.5)	
	100	14.4 (15.9)	16.1 (17.5)	17.3 (18.8)	18.4 (19.8)	18.4 (19.8)	
	≥150	17.8 (19.3)	19.4 (20.7)	20.5 (21.8)	22.4 (23.5)	22.4 (23.5)	

() values in parenthesis for uncracked concrete

C30/37 concrete grade

Design resistance [kN]

N_{Rd}	Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 105	150	200	350	≥500	Anchor spacing [mm]
	50	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	100
	75	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	100	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	≥150	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	50	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	150
	75	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	100	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	≥150	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	50	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	200
	75	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	100	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	≥150	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
	50	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	250
	75	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	
	100	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	
	≥150	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	

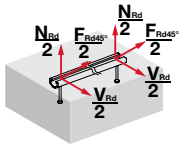
Design resistance [kN]

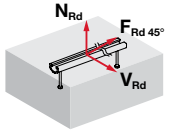
V_{Rd}	Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 105	150	200	350	≥500	Anchor spacing [mm]
	50	6.8 (7.9)	8.1 (9.4)	8.3 (9.6)	8.3 (9.6)	8.3 (9.6)	100
	75	10.3 (12.0)	12.3 (14.4)	14.2 (16.6)	14.4 (16.9)	14.4 (16.9)	
	100	13.9 (16.2)	16.5 (19.3)	19.1 (19.4)	19.4 (19.4)	19.4 (19.4)	
	≥150	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
	50	7.1 (8.3)	8.4 (9.8)	8.6 (10.1)	8.6 (10.1)	8.6 (10.1)	150
	75	10.7 (12.5)	12.8 (14.9)	14.8 (17.2)	15.0 (17.5)	15.0 (17.5)	
	100	14.3 (16.6)	17.0 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
	≥150	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
	50	7.2 (8.3)	8.6 (10.0)	8.7 (10.2)	8.7 (10.2)	8.7 (10.2)	200
	75	10.8 (12.6)	13.0 (15.1)	15.0 (17.5)	15.2 (17.7)	15.2 (17.7)	
	100	14.5 (16.9)	17.3 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
	≥150	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
	50	7.0 (8.2)	8.4 (9.8)	8.6 (10.0)	8.6 (10.0)	8.6 (10.0)	250
	75	10.8 (12.6)	12.9 (15.0)	14.9 (17.3)	15.1 (17.6)	15.1 (17.6)	
	100	14.4 (16.9)	17.2 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
	≥150	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	

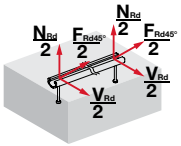
Design resistance [kN]

$F_{Rd\ 45°}$	Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 105	150	200	350	≥500	Anchor spacing [mm]
	50	8.0 (9.6)	9.1 (11.2)	9.3 (11.4)	9.3 (11.4)	9.3 (11.4)	100
	75	11.5 (13.4)	13.0 (15.2)	14.2 (15.9)	14.3 (15.9)	14.3 (15.9)	
	100	14.7 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
	≥150	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
	50	8.4 (10.0)	9.5 (11.4)	9.7 (11.6)	9.7 (11.6)	9.7 (11.6)	150
	75	11.9 (13.5)	13.5 (15.1)	14.7 (15.9)	14.9 (15.9)	14.9 (15.9)	
	100	14.7 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
	≥150	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
	50	8.5 (9.9)	9.7 (11.3)	9.8 (11.5)	9.8 (11.5)	9.8 (11.5)	200
	75	12.0 (13.3)	13.5 (14.8)	14.7 (15.9)	14.9 (15.9)	14.9 (15.9)	
	100	14.4 (15.7)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
	≥150	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
	50	8.3 (9.7)	9.5 (11.0)	9.7 (11.1)	9.7 (11.1)	9.7 (11.1)	250
	75	11.7 (13.0)	13.1 (14.4)	14.3 (15.6)	14.4 (15.6)	14.4 (15.6)	
	100	14.0 (15.3)	15.5 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
	≥150	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	

() values in parenthesis for uncracked concrete







C50/60 concrete grade

N_{Rd}

$s_s \geq 80$ mm — Total design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 105	150	200	350	≥500	Anchor spacing [mm]
50	15.6 (20.6)	15.6 (22.0)	15.6 (22.0)	15.6 (22.0)	15.6 (22.0)	100
75	19.2 (25.4)	19.2 (26.1)	19.2 (26.1)	19.2 (26.1)	19.2 (26.1)	
100	22.2 (26.1)	22.2 (26.1)	22.2 (26.1)	22.2 (26.1)	22.2 (26.1)	
≥150	26.1 (26.1)	26.1 (26.1)	26.1 (26.1)	26.1 (26.1)	26.1 (26.1)	
50	16.5 (21.7)	16.5 (23.1)	16.5 (23.1)	16.5 (23.1)	16.5 (23.1)	150
75	20.2 (23.3)	20.2 (23.3)	20.2 (23.3)	20.2 (23.3)	20.2 (23.3)	
100	23.3 (23.3)	23.3 (23.3)	23.3 (23.3)	23.3 (23.3)	23.3 (23.3)	
≥150	23.3 (23.3)	23.3 (23.3)	23.3 (23.3)	23.3 (23.3)	23.3 (23.3)	
50	17.0 (21.4)	17.0 (21.4)	17.0 (21.4)	17.0 (21.4)	17.0 (21.4)	200
75	20.8 (21.4)	20.8 (21.4)	20.8 (21.4)	20.8 (21.4)	20.8 (21.4)	
100	21.4 (21.4)	21.4 (21.4)	21.4 (21.4)	21.4 (21.4)	21.4 (21.4)	
≥150	21.4 (21.4)	21.4 (21.4)	21.4 (21.4)	21.4 (21.4)	21.4 (21.4)	
50	17.1 (19.5)	17.1 (19.5)	17.1 (19.5)	17.1 (19.5)	17.1 (19.5)	250
75	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	
100	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	
≥150	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	

V_{Rd}

$s_s \geq 80$ mm — Total design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 105	150	200	350	≥500	Anchor spacing [mm]
50	7.3 (8.5)	8.7 (10.1)	8.9 (10.3)	8.9 (10.3)	8.9 (10.3)	100
75	10.9 (12.7)	13.0 (15.1)	15.0 (17.5)	15.2 (17.8)	15.2 (17.8)	
100	14.4 (16.9)	17.2 (20.1)	19.9 (23.2)	22.6 (26.2)	22.6 (26.2)	
≥150	21.5 (25.1)	25.8 (30.0)	29.7 (34.7)	38.8 (38.8)	38.8 (38.8)	
50	7.8 (9.1)	9.3 (10.9)	9.5 (11.1)	9.5 (11.1)	9.5 (11.1)	150
75	11.5 (13.4)	13.7 (16.0)	15.8 (18.4)	16.1 (18.7)	16.1 (18.7)	
100	15.0 (17.6)	18.0 (21.0)	20.8 (24.3)	23.6 (27.5)	23.6 (27.5)	
≥150	22.2 (25.9)	26.5 (31.0)	30.6 (35.6)	38.8 (38.8)	38.8 (38.8)	
50	8.0 (9.4)	9.6 (11.2)	9.8 (11.4)	9.8 (11.4)	9.8 (11.4)	200
75	11.8 (13.7)	14.1 (16.4)	16.2 (19.0)	16.5 (19.3)	16.5 (19.3)	
100	15.5 (18.0)	18.4 (21.5)	21.3 (24.9)	24.0 (28.1)	24.0 (28.1)	
≥150	22.6 (26.4)	27.0 (31.5)	31.2 (36.4)	38.8 (38.8)	38.8 (38.8)	
50	7.9 (9.2)	9.5 (11.1)	9.7 (11.2)	9.7 (11.2)	9.7 (11.2)	250
75	11.9 (13.8)	14.2 (16.5)	16.4 (19.0)	16.6 (19.4)	16.6 (19.4)	
100	15.6 (18.1)	18.6 (21.7)	21.5 (25.0)	24.3 (28.3)	24.3 (28.3)	
≥150	22.8 (26.6)	27.2 (31.7)	31.5 (36.6)	38.8 (38.8)	38.8 (38.8)	

$F_{Rd\,45°}$

$s_s \geq 80$ mm — Total design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 105	150	200	350	≥500	Anchor spacing [mm]
50	8.6 (10.3)	9.8 (12.0)	9.9 (12.2)	9.9 (12.2)	9.9 (12.2)	100
75	12.2 (14.7)	13.7 (16.8)	15.0 (18.5)	15.1 (18.7)	15.1 (18.7)	
100	15.4 (18.1)	17.2 (20.2)	18.7 (21.9)	20.0 (23.4)	20.0 (23.4)	
≥150	21.0 (22.8)	23.1 (24.9)	24.8 (26.4)	27.7 (29.1)	27.8 (29.2)	
50	9.1 (11.0)	10.4 (12.8)	10.6 (12.9)	10.6 (12.9)	10.6 (12.9)	150
75	12.8 (14.9)	14.4 (16.8)	15.8 (18.3)	15.9 (18.5)	15.9 (18.5)	
100	16.2 (17.8)	18.1 (19.7)	19.6 (21.2)	20.9 (22.5)	20.9 (22.5)	
≥150	20.3 (21.9)	22.1 (23.6)	23.5 (24.9)	25.9 (27.1)	26.0 (27.1)	
50	9.4 (11.2)	10.7 (12.8)	10.9 (13.0)	10.9 (13.0)	10.9 (13.0)	200
75	13.2 (14.7)	14.8 (16.5)	16.2 (17.9)	16.3 (18.1)	16.3 (18.1)	
100	15.9 (17.4)	17.6 (19.1)	19.0 (20.5)	20.2 (21.6)	20.2 (21.6)	
≥150	19.6 (21.0)	21.2 (22.5)	22.5 (23.6)	24.5 (25.5)	24.5 (25.5)	
50	9.3 (10.9)	10.6 (12.4)	10.8 (12.6)	10.8 (12.6)	10.8 (12.6)	250
75	13.0 (14.4)	14.6 (16.0)	15.9 (17.3)	16.1 (17.5)	16.1 (17.5)	
100	15.5 (16.9)	17.1 (18.4)	18.4 (19.7)	19.4 (20.6)	19.4 (20.6)	
≥150	18.9 (20.1)	20.3 (21.5)	21.4 (22.5)	23.2 (24.0)	23.2 (24.1)	

() values in parenthesis for uncracked concrete

N_{Rd}

Design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 105	150	200	350	≥500	Anchor spacing [mm]
50	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	100
75	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
100	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
≥150	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
50	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	150
75	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
100	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
≥150	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
50	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	200
75	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
100	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
≥150	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	13.9 (13.9)	
50	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	250
75	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	
100	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	
≥150	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	13.8 (13.8)	

V_{Rd}

Design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 105	150	200	350	≥500	Anchor spacing [mm]
50	8.6 (10.1)	10.3 (12.0)	10.5 (12.3)	10.5 (12.3)	10.5 (12.3)	100
75	13.1 (15.3)	15.7 (18.3)	18.1 (19.4)	18.4 (19.4)	18.4 (19.4)	
100	17.6 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
≥150	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
50	9.0 (10.5)	10.8 (12.6)	11.0 (12.8)	11.0 (12.8)	11.0 (12.8)	150
75	13.6 (15.9)	16.2 (19.0)	18.8 (19.4)	19.0 (19.4)	19.0 (19.4)	
100	18.2 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
≥150	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
50	9.1 (10.6)	10.9 (12.7)	11.1 (13.0)	11.1 (13.0)	11.1 (13.0)	200
75	13.8 (16.1)	16.5 (19.3)	19.0 (19.4)	19.4 (19.4)	19.4 (19.4)	
100	18.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
≥150	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
50	9.0 (10.5)	10.7 (12.5)	10.9 (12.7)	10.9 (12.7)	10.9 (12.7)	250
75	13.7 (16.0)	16.4 (19.2)	18.9 (19.4)	19.2 (19.4)	19.2 (19.4)	
100	18.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
≥150	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	

$F_{Rd\,45°}$

Design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 105	150	200	350	≥500	Anchor spacing [mm]
50	10.2 (11.8)	11.6 (13.4)	11.8 (13.6)	11.8 (13.6)	11.8 (13.6)	100
75	14.3 (15.8)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
100	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
≥150	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
50	10.6 (12.0)	12.2 (13.5)	12.3 (13.7)	12.3 (13.7)	12.3 (13.7)	150
75	14.3 (15.6)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
100	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
≥150	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
50	10.6 (11.8)	12.0 (13.4)	12.2 (13.5)	12.2 (13.5)	12.2 (13.5)	200
75	14.0 (15.4)	15.6 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
100	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
≥150	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
50	10.3 (11.5)	11.7 (12.9)	11.8 (13.1)	11.8 (13.1)	11.8 (13.1)	250
75	13.7 (14.9)	15.1 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
100	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	
≥150	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	15.9 (15.9)	

() values in parenthesis for uncracked concrete

N_{Rd}

$s_s \geq 80$ mm — Total design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 105	150	200	350	≥500	Anchor spacing [mm]
50	20.0 (26.1)	20.0 (26.1)	20.0 (26.1)	20.0 (26.1)	20.0 (26.1)	100
75	24.4 (26.1)	24.4 (26.1)	24.4 (26.1)	24.4 (26.1)	24.4 (26.1)	
100	26.1 (26.1)	26.1 (26.1)	26.1 (26.1)	26.1 (26.1)	26.1 (26.1)	
≥150	26.1 (26.1)	26.1 (26.1)	26.1 (26.1)	26.1 (26.1)	26.1 (26.1)	
50	21.0 (23.3)	21.0 (23.3)	21.0 (23.3)	21.0 (23.3)	21.0 (23.3)	150
75	23.3 (23.3)	23.3 (23.3)	23.3 (23.3)	23.3 (23.3)	23.3 (23.3)	
100	23.3 (23.3)	23.3 (23.3)	23.3 (23.3)	23.3 (23.3)	23.3 (23.3)	
≥150	23.3 (23.3)	23.3 (23.3)	23.3 (23.3)	23.3 (23.3)	23.3 (23.3)	
50	21.4 (21.4)	21.4 (21.4)	21.4 (21.4)	21.4 (21.4)	21.4 (21.4)	200
75	21.4 (21.4)	21.4 (21.4)	21.4 (21.4)	21.4 (21.4)	21.4 (21.4)	
100	21.4 (21.4)	21.4 (21.4)	21.4 (21.4)	21.4 (21.4)	21.4 (21.4)	
≥150	21.4 (21.4)	21.4 (21.4)	21.4 (21.4)	21.4 (21.4)	21.4 (21.4)	
50	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	250
75	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	
100	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	
≥150	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	19.5 (19.5)	

V_{Rd}

$s_s \geq 80$ mm — Total design resistance [kN]

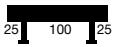
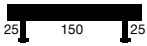
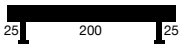
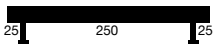
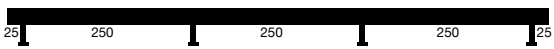
Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 105	150	200	350	≥500	Anchor spacing [mm]
50	9.3 (10.8)	11.1 (13.0)	11.3 (13.2)	11.3 (13.2)	11.3 (13.2)	100
75	13.9 (16.1)	16.5 (19.3)	19.1 (22.3)	19.4 (22.6)	19.4 (22.6)	
100	18.4 (21.5)	22.0 (25.6)	25.4 (29.5)	28.7 (33.4)	28.7 (33.4)	
≥150	27.3 (32.0)	32.7 (38.2)	37.8 (38.8)	38.8 (38.8)	38.8 (38.8)	
50	9.9 (11.5)	11.9 (13.8)	12.1 (14.1)	12.1 (14.1)	12.1 (14.1)	150
75	14.6 (17.0)	17.5 (20.4)	20.1 (23.4)	20.4 (23.8)	20.4 (23.8)	
100	19.2 (22.3)	23.0 (26.7)	26.5 (30.9)	29.9 (34.9)	29.9 (34.9)	
≥150	28.2 (33.0)	33.7 (38.8)	38.8 (38.8)	38.8 (38.8)	38.8 (38.8)	
50	10.2 (11.9)	12.2 (14.2)	12.5 (14.5)	12.5 (14.5)	12.5 (14.5)	200
75	15.0 (17.5)	18.0 (20.9)	20.8 (24.2)	21.0 (24.5)	21.0 (24.5)	
100	19.7 (23.0)	23.5 (27.5)	27.1 (31.7)	30.8 (35.9)	30.8 (35.9)	
≥150	28.8 (33.6)	34.4 (38.8)	38.8 (38.8)	38.8 (38.8)	38.8 (38.8)	
50	10.1 (11.8)	12.0 (14.0)	12.3 (14.4)	12.3 (14.4)	12.3 (14.4)	250
75	15.1 (17.6)	18.1 (21.0)	20.8 (24.3)	21.1 (24.7)	21.1 (24.7)	
100	19.8 (23.1)	23.7 (27.6)	27.3 (31.9)	31.0 (36.1)	31.0 (36.1)	
≥150	29.0 (33.8)	34.7 (38.8)	38.8 (38.8)	38.8 (38.8)	38.8 (38.8)	

$F_{Rd\,45°}$

$s_s \geq 80$ mm — Total design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 105	150	200	350	≥500	Anchor spacing [mm]
50	10.9 (13.1)	12.5 (15.0)	12.6 (15.2)	12.6 (15.2)	12.6 (15.2)	100
75	15.5 (17.5)	17.5 (19.7)	19.0 (21.4)	19.2 (21.6)	19.2 (21.6)	
100	19.1 (20.9)	21.2 (23.1)	23.0 (24.7)	24.4 (26.1)	24.4 (26.1)	
≥150	23.8 (25.6)	25.8 (27.5)	27.3 (28.8)	29.9 (31.1)	30.0 (31.1)	
50	11.6 (13.4)	13.3 (15.2)	13.4 (15.4)	13.4 (15.4)	13.4 (15.4)	150
75	15.8 (17.5)	17.7 (19.4)	19.3 (20.9)	19.4 (21.0)	19.4 (21.0)	
100	18.7 (20.4)	20.6 (22.2)	22.1 (23.6)	23.3 (24.7)	23.3 (24.7)	
≥150	22.7 (24.2)	24.4 (25.7)	25.6 (26.9)	27.6 (28.6)	27.7 (28.7)	
50	11.9 (13.4)	13.6 (15.1)	13.8 (15.3)	13.8 (15.3)	13.8 (15.3)	200
75	15.6 (17.1)	17.4 (18.8)	18.7 (20.2)	18.9 (20.3)	18.9 (20.3)	
100	18.2 (19.7)	20.0 (21.3)	21.2 (22.5)	22.3 (23.5)	22.3 (23.5)	
≥150	21.8 (23.0)	23.2 (24.3)	24.3 (25.2)	25.9 (26.9)	26.0 (26.9)	
50	11.6 (13.0)	13.2 (14.6)	13.4 (14.7)	13.4 (14.7)	13.4 (14.7)	250
75	15.2 (16.6)	16.9 (18.2)	18.1 (19.4)	18.2 (19.5)	18.2 (19.5)	
100	17.7 (19.0)	19.2 (20.4)	20.4 (21.5)	21.2 (22.4)	21.2 (22.4)	
≥150	20.8 (21.9)	22.1 (23.1)	23.0 (23.8)	24.5 (24.7)	24.5 (24.7)	

() values in parenthesis for uncracked concrete

Channel length [mm]	Anchor spacing [mm]	Number of anchors [pcs]	
150	100	2	
200	150	2	
250	200	2	
300	250	2	
350	150	3	
450	200	3	
550	250	3	
800	250	4	
1050	250	5	
1300	250	6	
1550	250	7	
1800	250	8	
2050	250	9	
2300	250	10	
5800	250	24	

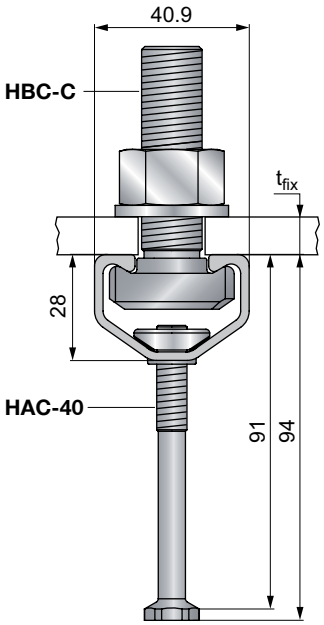
Other anchor channel lengths on request.

Minimum requirements

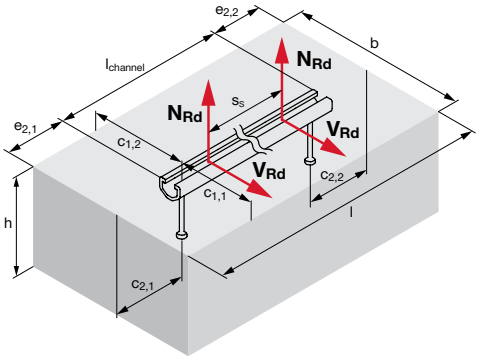
Dimensions	[mm]
$c_{1,i}$	50
h	94 + c
b	100
l	50 + $l_{channel}$
c = concrete cover according to DIN EN 1992-1-1:2005	

Edge distance $c_{1,1}$ [mm] $c_{1,2} \geq c_{1,1}$	Minimum corner distance min $c_{2,1}$; min $c_{2,2}$ [mm]
50	195
75	195
100	241
150	341

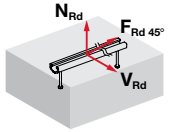
	Bolt length [mm]	Clamping length t_{fix} [mm]
M10	30	11
	40	21
	50	31
	60	41
	70	51
	80	61
	100	81
M12	30	8
	40	18
	50	28
	60	38
	80	58
	100	78
	125	103
	150	128
M16	30	3
	40	13
	50	23
	60	33
	65	38
	70	43
	80	53
	100	73
	125	98
	150	123
	200	173
	290	263
M20	50	18
	60	28
	80	48
	100	68
	125	93
	150	118

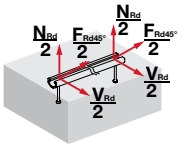


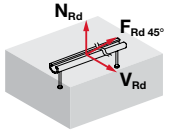
HBC-C [kN]				
		$N_{Rd.s}$	$V_{Rd.s}$	$F_{Rd.s.45°}$
M10	4.6	11.60	8.32	10.09
	A4-50	10.14	7.31	8.87
M12	4.6	16.85	12.10	14.70
	A4-50	14.74	10.63	12.89
M16	4.6	31.34	22.51	27.36
	8.8	83.57	50.16	66.24
	A4-50	27.42	19.75	23.89
M20	4.6	49.00	35.21	42.66
	8.8	130.67	78.32	103.48
	A4-50	42.83	30.84	37.32



HAC-50 design tables







C25/30 concrete grade

Design resistance [kN]

N_{Rd}		Member thickness h [mm]										Anchor spacing [mm]
		120		150		200		350		≥500		
Edge distance $c_{1,1}$ [mm]	75	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	100
	100	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	
	150	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	
	≥200	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	
	75	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	150
	100	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	
	150	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	
	≥200	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	
	75	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	200
	100	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	
	150	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	
	≥200	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	
	75	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	250
	100	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	
	150	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	
	≥200	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	

$s_s \geq 85$ mm Total design resistance [kN]

N_{Rd}		Member thickness h [mm]										Anchor spacing [mm]
		120		150		200		350		≥500		
Edge distance $c_{1,1}$ [mm]	75	21.9	(28.4)	21.9	(30.5)	21.9	(30.5)	21.9	(30.5)	21.9	(30.5)	100
	100	25.1	(32.8)	25.1	(34.9)	25.1	(34.9)	25.1	(34.9)	25.1	(34.9)	
	150	30.8	(34.9)	30.8	(34.9)	30.8	(34.9)	30.8	(34.9)	30.8	(34.9)	
	≥200	34.9	(34.9)	34.9	(34.9)	34.9	(34.9)	34.9	(34.9)	34.9	(34.9)	
	75	23.0	(29.9)	23.0	(31.2)	23.0	(31.2)	23.0	(31.2)	23.0	(31.2)	150
	100	26.5	(31.2)	26.5	(31.2)	26.5	(31.2)	26.5	(31.2)	26.5	(31.2)	
	150	31.2	(31.2)	31.2	(31.2)	31.2	(31.2)	31.2	(31.2)	31.2	(31.2)	
	≥200	31.2	(31.2)	31.2	(31.2)	31.2	(31.2)	31.2	(31.2)	31.2	(31.2)	
	75	23.6	(28.7)	23.6	(28.7)	23.6	(28.7)	23.6	(28.7)	23.6	(28.7)	200
	100	27.2	(28.7)	27.2	(28.7)	27.2	(28.7)	27.2	(28.7)	27.2	(28.7)	
	150	28.7	(28.7)	28.7	(28.7)	28.7	(28.7)	28.7	(28.7)	28.7	(28.7)	
	≥200	28.7	(28.7)	28.7	(28.7)	28.7	(28.7)	28.7	(28.7)	28.7	(28.7)	
	75	23.8	(26.6)	23.8	(26.6)	23.8	(26.6)	23.8	(26.6)	23.8	(26.6)	250
	100	26.6	(26.6)	26.6	(26.6)	26.6	(26.6)	26.6	(26.6)	26.6	(26.6)	
	150	26.6	(26.6)	26.6	(26.6)	26.6	(26.6)	26.6	(26.6)	26.6	(26.6)	
	≥200	26.6	(26.6)	26.6	(26.6)	26.6	(26.6)	26.6	(26.6)	26.6	(26.6)	

Design resistance [kN]

V_{Rd}		Member thickness h [mm]										Anchor spacing [mm]
		120		150		200		350		≥500		
Edge distance $c_{1,1}$ [mm]	75	9.8	(11.4)	10.9	(12.8)	12.6	(14.8)	13.0	(15.2)	13.0	(15.2)	100
	100	13.2	(15.4)	14.8	(17.2)	17.0	(19.9)	19.5	(22.7)	19.5	(22.7)	
	150	20.0	(23.3)	22.3	(26.1)	25.8	(28.3)	28.3	(28.3)	28.3	(28.3)	
	≥200	26.7	(28.3)	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	
	75	10.2	(11.9)	11.4	(13.3)	13.1	(15.3)	13.5	(15.8)	13.5	(15.8)	150
	100	13.6	(15.9)	15.2	(17.7)	17.6	(20.5)	20.1	(23.4)	20.1	(23.4)	
	150	20.4	(23.8)	22.8	(26.6)	26.4	(28.3)	28.3	(28.3)	28.3	(28.3)	
	≥200	27.2	(28.3)	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	
	75	10.3	(12.1)	11.5	(13.5)	13.4	(15.6)	13.7	(16.1)	13.7	(16.1)	200
	100	13.8	(16.1)	15.5	(18.0)	17.8	(20.8)	20.4	(23.8)	20.4	(23.8)	
	150	20.6	(24.2)	23.1	(27.0)	26.7	(28.3)	28.3	(28.3)	28.3	(28.3)	
	≥200	27.5	(28.3)	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	
	75	10.3	(12.0)	11.5	(13.4)	13.3	(15.5)	13.7	(16.0)	13.7	(16.0)	250
	100	13.8	(16.1)	15.5	(18.1)	17.8	(20.8)	20.4	(23.8)	20.4	(23.8)	
	150	20.8	(24.2)	23.2	(27.0)	26.7	(28.3)	28.3	(28.3)	28.3	(28.3)	
	≥200	27.6	(28.3)	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	

$s_s \geq 85$ mm Total design resistance [kN]

V_{Rd}		Member thickness h [mm]										Anchor spacing [mm]
		120		150		200		350		≥500		
Edge distance $c_{1,1}$ [mm]	75	10.3	(12.0)	11.5	(13.5)	13.3	(15.6)	13.7	(16.0)	13.7	(16.0)	100
	100	13.7	(16.1)	15.4	(18.0)	17.8	(20.8)	20.3	(23.7)	20.3	(23.7)	
	150	20.5	(24.0)	23.0	(26.9)	26.6	(31.0)	35.1	(41.0)	35.6	(41.7)	
	≥200	27.3	(32.0)	30.5	(35.6)	35.4	(41.2)	46.6	(54.4)	53.7	(56.6)	
	75	10.9	(12.8)	12.2	(14.2)	14.1	(16.5)	14.5	(17.0)	14.5	(17.0)	150
	100	14.4	(16.8)	16.1	(18.7)	18.6	(21.6)	21.2	(24.8)	21.2	(24.8)	
	150	21.2	(24.8)	23.7	(27.7)	27.3	(32.0)	36.2	(42.2)	36.9	(43.0)	
	≥200	28.1	(32.7)	31.4	(36.6)	36.1	(42.2)	47.8	(55.9)	54.9	(56.6)	
	75	11.2	(13.1)	12.6	(14.7)	14.5	(17.0)	15.0	(17.5)	15.0	(17.5)	200
	100	14.8	(17.2)	16.5	(19.3)	19.0	(22.2)	21.9	(25.5)	21.9	(25.5)	
	150	21.7	(25.3)	24.2	(28.3)	28.0	(32.7)	37.0	(43.2)	37.6	(43.9)	
	≥200	28.6	(33.2)	31.9	(37.1)	36.9	(43.0)	48.6	(56.6)	55.9	(56.6)	
	75	11.4	(13.3)	12.7	(14.8)	14.7	(17.1)	15.1	(17.6)	15.1	(17.6)	250
	100	14.9	(17.4)	16.7	(19.5)	19.3	(22.5)	22.1	(25.8)	22.1	(25.8)	
	150	21.9	(25.5)	24.4	(28.6)	28.2	(33.0)	37.3	(43.7)	38.1	(44.4)	
	≥200	28.7	(33.4)	32.1	(37.5)	37.1	(43.2)	49.0	(56.6)	56.4	(56.6)	

Design resistance [kN]

$F_{Rd\ 45°}$		Member thickness h [mm]										Anchor spacing [mm]
		120		150		200		350		≥500		
Edge distance $c_{1,1}$ [mm]	75	11.5	(13.8)	12.5	(15.1)	13.8	(16.9)	14.1	(17.2)	14.1	(17.2)	100
	100	14.9	(17.4)	16.1	(18.8)	17.6	(20.6)	19.1	(22.4)	19.1	(22.4)	
	150	20.7	(22.6)	22.2	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	
	≥200	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	
	75	11.9	(14.1)	13.0	(15.3)	14.3	(17.0)	14.6	(17.3)	14.6	(17.3)	150
	100	15.3	(17.4)	16.6	(18.7)	18.2	(20.5)	19.8	(22.1)	19.8	(22.1)	
	150	20.4	(22.3)	21.8	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	
	≥200	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	
	75	12.2	(14.0)	13.2	(15.3)	14.6	(16.9)	14.9	(17.2)	14.9	(17.2)	200
	100	15.5	(17.2)	16.8	(18.5)	18.4	(20.1)	19.9	(21.7)	19.9	(21.7)	
	150	20.0	(21.8)	21.3	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	
	≥200	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	
	75	12.1	(13.8)	13.1	(15.0)	14.6	(16.5)	14.8	(16.8)	14.8	(16.8)	250
	100	15.2	(16.9)	16.4	(18.1)	18.0	(19.6)	19.4	(21.0)	19.4	(21.0)	
	150	19.6	(21.2)	20.7	(22.3)	22.2	(22.6)	22.6	(22.6)	22.6	(22.6)	
	≥200	22.5	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	

$s_s \geq 85$ mm Total design resistance [kN]

$F_{Rd\ 45°}$		Member thickness h [mm]										Anchor spacing [mm]
		120		150		200		350		≥500		
Edge distance $c_{1,1}$ [mm]	75	12.1	(14.5)	13.1	(16.1)	14.6	(17.9)	14.8	(18.3)	14.8	(18.3)	100
	100	15.5	(18.7)	16.8	(20.6)	18.4	(22.8)	20.0	(25.0)	20.0	(25.0)	
	150	21.8	(25.1)	23.4	(26.9)	25.4	(29.3)	29.3	(33.6)	29.4	(33.8)	
	≥200	27.3	(29.7)	29.0	(31.5)	31.3	(33.7)	35.5	(37.5)	37.3	(39.2)	
	75	12.8	(15.3)	13.9	(16.9)	15.3	(18.7)	15.6	(19.2)	15.6	(19.2)	150
	100	16.2	(19.0)	17.5	(20.6)	19.3	(22.6)	20.9	(24.6)	20.9	(24.6)	
	150	22.4	(24.5)	23.9	(26.2)	26.0	(28.1)	29.9	(31.9)	30.1	(32.1)	
	200	26.3	(28.5)	27.9	(30.0)	29.9	(31.9)	33.3	(35.0)	34.9	(36.4)	
	75	13.2	(15.6)	14.3	(16.9)	15.8	(18.7)	16.2	(19.1)	16.2	(19.1)	200
	100	16.7	(18.9)	18.1	(20.4)	19.9	(22.3)	21.6	(24.0)	21.6	(24.0)	
	150	21.9	(23.9)	23.4	(25.4)	25.2	(27.2)	28.7	(30.4)	28.8	(30.6)	
	≥200	25.5	(27.4)	26.9	(28.8)	28.6	(30.4)	31.6	(33.1)	33.0	(34.2)	
	75	13.3	(15.3)	14.4	(16.6)	16.0	(18.4)	16.3	(18.7)	16.3	(18.7)	250
	100	16.7	(18.6)	18.1	(20.0)	19.8	(21.7)	21.4	(23.3)	21.4	(23.3)	
	150	21.3	(23.2)	22.7	(24.5)	24.4	(26.2)	27.5	(29.0)	27.7	(29.2)	
	≥200	24.6	(26.3)	25.9	(27.5)	27.5	(28.9)	30.0	(31.3)	31.3	(32.3)	

() values in parenthesis for uncracked concrete

C30/37 concrete grade

Design resistance [kN]

N_{Rd}		Member thickness h [mm]										Anchor spacing [mm]
		120		150		200		350		≥500		
Edge distance $c_{1,1}$ [mm]	75	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	100
	100	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	
	150	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	
	≥200	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	
	75	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	150
	100	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	
	150	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	
	≥200	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	
	75	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	200
	100	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	
	150	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	
	≥200	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	
	75	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	250
	100	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	
	150	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	
	≥200	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	19.4	(19.4)	

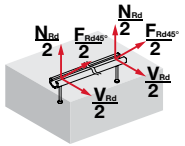
Design resistance [kN]

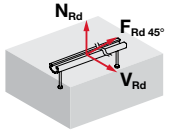
V_{Rd}		Member thickness h [mm]										Anchor spacing [mm]
		120		150		200		350		≥500		
Edge distance $c_{1,1}$ [mm]	75	10.9	(12.7)	12.2	(14.2)	14.0	(16.4)	14.5	(16.9)	14.5	(16.9)	100
	100	14.7	(17.1)	16.4	(19.1)	18.9	(22.1)	21.6	(25.3)	21.6	(25.3)	
	150	22.2	(25.9)	24.8	(28.3)	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	
	≥200	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	
	75	11.3	(13.2)	12.6	(14.7)	14.6	(17.0)	15.0	(17.5)	15.0	(17.5)	150
	100	15.1	(17.6)	16.9	(19.7)	19.5	(22.7)	22.3	(26.0)	22.3	(26.0)	
	150	22.7	(26.5)	25.4	(28.3)	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	
	≥200	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	
	75	11.5	(13.4)	12.8	(15.0)	14.8	(17.3)	15.3	(17.8)	15.3	(17.8)	200
	100	15.3	(17.9)	17.2	(20.0)	19.8	(23.1)	22.7	(26.5)	22.7	(26.5)	
	150	23.0	(26.9)	25.6	(28.3)	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	
	≥200	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	
	75	11.5	(13.4)	12.8	(15.0)	14.8	(17.3)	15.3	(17.8)	15.3	(17.8)	250
	100	15.4	(18.0)	17.2	(20.0)	19.8	(23.1)	22.7	(26.5)	22.7	(26.5)	
	150	23.0	(26.9)	25.8	(28.3)	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	
	≥200	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	28.3	(28.3)	

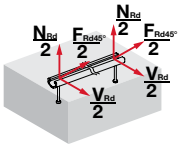
Design resistance [kN]

$F_{Rd\ 45°}$		Member thickness h [mm]										Anchor spacing [mm]
		120		150		200		350		≥500		
Edge distance $c_{1,1}$ [mm]	75	12.8	(15.1)	13.9	(16.4)	15.3	(18.1)	15.6	(18.5)	15.6	(18.5)	100
	100	16.5	(18.7)	17.8	(20.1)	19.6	(22.0)	21.2	(22.6)	21.2	(22.6)	
	150	22.1	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	
	≥200	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	
	75	13.3	(15.3)	14.4	(16.5)	15.9	(18.2)	16.2	(18.6)	16.2	(18.6)	150
	100	16.8	(18.7)	18.1	(20.0)	19.9	(21.8)	21.5	(22.6)	21.5	(22.6)	
	150	21.7	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	
	≥200	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	
	75	13.5	(15.2)	14.7	(16.4)	16.2	(18.1)	16.5	(18.4)	16.5	(18.4)	200
	100	16.7	(18.4)	17.9	(19.7)	19.6	(21.3)	21.1	(22.6)	21.1	(22.6)	
	150	21.2	(22.6)	22.5	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	
	≥200	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	
	75	13.3	(14.9)	14.4	(16.1)	15.9	(17.6)	16.2	(17.9)	16.2	(17.9)	250
	100	16.3	(18.0)	17.5	(19.2)	19.1	(20.7)	20.5	(22.1)	20.5	(22.1)	
	150	20.6	(22.3)	21.9	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	
	≥200	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	22.6	(22.6)	

() values in parenthesis for uncracked concrete







C50/60 concrete grade

N_{Rd}

$s_s \geq 85$ mm — Total design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 120	150	200	350	≥500	Anchor spacing [mm]
75	24.2 (33.9)	24.2 (33.9)	24.2 (33.9)	24.2 (33.9)	24.2 (33.9)	100
100	28.0 (34.9)	28.0 (34.9)	28.0 (34.9)	28.0 (34.9)	28.0 (34.9)	
150	34.2 (34.9)	34.2 (34.9)	34.2 (34.9)	34.2 (34.9)	34.2 (34.9)	
≥200	34.9 (34.9)	34.9 (34.9)	34.9 (34.9)	34.9 (34.9)	34.9 (34.9)	
75	25.4 (31.2)	25.4 (31.2)	25.4 (31.2)	25.4 (31.2)	25.4 (31.2)	150
100	29.4 (31.2)	29.4 (31.2)	29.4 (31.2)	29.4 (31.2)	29.4 (31.2)	
150	31.2 (31.2)	31.2 (31.2)	31.2 (31.2)	31.2 (31.2)	31.2 (31.2)	
≥200	31.2 (31.2)	31.2 (31.2)	31.2 (31.2)	31.2 (31.2)	31.2 (31.2)	
75	26.2 (28.7)	26.2 (28.7)	26.2 (28.7)	26.2 (28.7)	26.2 (28.7)	200
100	28.7 (28.7)	28.7 (28.7)	28.7 (28.7)	28.7 (28.7)	28.7 (28.7)	
150	28.7 (28.7)	28.7 (28.7)	28.7 (28.7)	28.7 (28.7)	28.7 (28.7)	
≥200	28.7 (28.7)	28.7 (28.7)	28.7 (28.7)	28.7 (28.7)	28.7 (28.7)	
75	26.5 (26.6)	26.5 (26.6)	26.5 (26.6)	26.5 (26.6)	26.5 (26.6)	250
100	26.6 (26.6)	26.6 (26.6)	26.6 (26.6)	26.6 (26.6)	26.6 (26.6)	
150	26.6 (26.6)	26.6 (26.6)	26.6 (26.6)	26.6 (26.6)	26.6 (26.6)	
≥200	26.6 (26.6)	26.6 (26.6)	26.6 (26.6)	26.6 (26.6)	26.6 (26.6)	

Design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 120	150	200	350	≥500	Anchor spacing [mm]
75	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	100
100	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
150	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
≥200	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
75	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	150
100	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
150	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
≥200	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
75	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	200
100	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
150	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
≥200	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
75	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	250
100	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
150	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	
≥200	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	19.4 (19.4)	

$s_s \geq 85$ mm — Total design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 120	150	200	350	≥500	Anchor spacing [mm]
75	30.8 (34.9)	30.8 (34.9)	30.8 (34.9)	30.8 (34.9)	30.8 (34.9)	100
100	34.9 (34.9)	34.9 (34.9)	34.9 (34.9)	34.9 (34.9)	34.9 (34.9)	
150	34.9 (34.9)	34.9 (34.9)	34.9 (34.9)	34.9 (34.9)	34.9 (34.9)	
≥200	34.9 (34.9)	34.9 (34.9)	34.9 (34.9)	34.9 (34.9)	34.9 (34.9)	
75	31.2 (31.2)	31.2 (31.2)	31.2 (31.2)	31.2 (31.2)	31.2 (31.2)	150
100	31.2 (31.2)	31.2 (31.2)	31.2 (31.2)	31.2 (31.2)	31.2 (31.2)	
150	31.2 (31.2)	31.2 (31.2)	31.2 (31.2)	31.2 (31.2)	31.2 (31.2)	
≥200	31.2 (31.2)	31.2 (31.2)	31.2 (31.2)	31.2 (31.2)	31.2 (31.2)	
75	28.7 (28.7)	28.7 (28.7)	28.7 (28.7)	28.7 (28.7)	28.7 (28.7)	200
100	28.7 (28.7)	28.7 (28.7)	28.7 (28.7)	28.7 (28.7)	28.7 (28.7)	
150	28.7 (28.7)	28.7 (28.7)	28.7 (28.7)	28.7 (28.7)	28.7 (28.7)	
≥200	28.7 (28.7)	28.7 (28.7)	28.7 (28.7)	28.7 (28.7)	28.7 (28.7)	
75	26.6 (26.6)	26.6 (26.6)	26.6 (26.6)	26.6 (26.6)	26.6 (26.6)	250
100	26.6 (26.6)	26.6 (26.6)	26.6 (26.6)	26.6 (26.6)	26.6 (26.6)	
150	26.6 (26.6)	26.6 (26.6)	26.6 (26.6)	26.6 (26.6)	26.6 (26.6)	
≥200	26.6 (26.6)	26.6 (26.6)	26.6 (26.6)	26.6 (26.6)	26.6 (26.6)	

V_{Rd}

$s_s \geq 85$ mm — Total design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 120	150	200	350	≥500	Anchor spacing [mm]
75	11.5 (13.4)	12.8 (15.0)	14.8 (17.3)	15.3 (17.8)	15.3 (17.8)	100
100	15.3 (17.8)	17.1 (19.9)	19.7 (23.0)	22.6 (26.4)	22.6 (26.4)	
150	22.8 (26.6)	25.5 (29.8)	29.5 (34.4)	39.0 (45.4)	39.7 (46.4)	
≥200	30.4 (35.4)	33.9 (39.5)	39.3 (45.8)	52.0 (56.6)	56.6 (56.6)	
75	12.1 (14.2)	13.6 (15.8)	15.6 (18.3)	16.1 (18.8)	16.1 (18.8)	150
100	16.0 (18.6)	17.8 (20.9)	20.6 (24.0)	23.6 (27.6)	23.6 (27.6)	
150	23.6 (27.5)	26.4 (30.8)	30.4 (35.5)	40.3 (46.9)	41.0 (47.8)	
≥200	31.1 (36.4)	34.8 (40.5)	40.3 (46.9)	53.2 (56.6)	56.6 (56.6)	
75	12.5 (14.6)	14.0 (16.4)	16.1 (18.8)	16.6 (19.4)	16.6 (19.4)	200
100	16.4 (19.2)	18.3 (21.4)	21.2 (24.7)	24.3 (28.3)	24.3 (28.3)	
150	24.0 (28.1)	26.9 (31.4)	31.0 (36.2)	41.0 (47.8)	41.7 (48.8)	
≥200	31.6 (36.9)	35.4 (41.2)	40.8 (47.6)	54.2 (56.6)	56.6 (56.6)	
75	12.6 (14.7)	14.1 (16.5)	16.3 (19.0)	16.7 (19.5)	16.7 (19.5)	250
100	16.6 (19.4)	18.6 (21.6)	21.4 (25.0)	24.5 (28.6)	24.5 (28.6)	
150	24.3 (28.3)	27.1 (31.7)	31.4 (36.6)	41.5 (48.3)	42.2 (49.3)	
≥200	32.0 (37.2)	35.6 (41.6)	41.2 (48.1)	54.4 (56.6)	56.6 (56.6)	

Design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 120	150	200	350	≥500	Anchor spacing [mm]
75	13.9 (16.2)	15.5 (18.1)	17.9 (20.9)	18.4 (21.5)	18.4 (21.5)	100
100	18.7 (21.7)	20.9 (24.3)	24.0 (28.1)	27.6 (28.3)	27.6 (28.3)	
150	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	
≥200	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	
75	14.4 (16.8)	16.1 (18.8)	18.6 (21.7)	19.2 (22.3)	19.2 (22.3)	150
100	19.2 (22.5)	21.5 (25.1)	24.9 (28.3)	28.3 (28.3)	28.3 (28.3)	
150	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	
≥200	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	
75	14.7 (17.1)	16.4 (19.0)	18.9 (22.1)	19.4 (22.7)	19.4 (22.7)	200
100	19.5 (22.8)	21.9 (25.5)	25.3 (28.3)	28.3 (28.3)	28.3 (28.3)	
150	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	
≥200	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	
75	14.6 (17.0)	16.3 (19.0)	18.8 (22.0)	19.4 (22.6)	19.4 (22.6)	250
100	19.5 (22.8)	21.9 (25.5)	25.3 (28.3)	28.3 (28.3)	28.3 (28.3)	
150	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	
≥200	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	28.3 (28.3)	

$s_s \geq 85$ mm — Total design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 120	150	200	350	≥500	Anchor spacing [mm]
75	14.6 (17.1)	16.4 (19.0)	18.9 (22.0)	19.4 (22.7)	19.4 (22.7)	100
100	19.4 (22.7)	21.7 (25.4)	25.1 (29.3)	28.8 (33.6)	28.8 (33.6)	
150	29.0 (33.9)	32.5 (38.0)	37.6 (43.8)	49.8 (56.6)	50.5 (56.6)	
≥200	38.7 (45.1)	43.2 (50.5)	50.0 (56.6)	56.6 (56.6)	56.6 (56.6)	
75	15.5 (18.0)	17.3 (20.1)	19.9 (23.3)	20.5 (23.9)	20.5 (23.9)	150
100	20.3 (23.7)	22.7 (26.5)	26.2 (30.6)	30.0 (35.0)	30.0 (35.0)	
150	30.0 (35.0)	33.6 (39.2)	38.8 (45.1)	51.2 (56.6)	52.2 (56.6)	
≥200	39.7 (46.4)	44.4 (51.7)	51.2 (56.6)	56.6 (56.6)	56.6 (56.6)	
75	15.9 (18.6)	17.8 (20.8)	20.6 (24.0)	21.2 (24.7)	21.2 (24.7)	200
100	20.9 (24.4)	23.3 (27.2)	27.0 (31.5)	30.9 (36.0)	30.9 (36.0)	
150	30.6 (35.8)	34.3 (40.0)	39.5 (46.1)	52.2 (56.6)	53.2 (56.6)	
≥200	40.3 (47.1)	45.1 (52.5)	52.0 (56.6)	56.6 (56.6)	56.6 (56.6)	
75	16.1 (18.7)	18.0 (21.0)	20.8 (24.2)	21.4 (24.9)	21.4 (24.9)	250
100	21.1 (24.7)	23.6 (27.6)	27.2 (31.7)	31.2 (36.4)	31.2 (36.4)	
150	31.0 (36.1)	34.7 (40.3)	40.0 (46.6)	52.7 (56.6)	53.7 (56.6)	
≥200	40.6 (47.3)	45.4 (53.0)	52.5 (56.6)	56.6 (56.6)	56.6 (56.6)	

$F_{Rd\ 45°}$

$s_s \geq 85$ mm — Total design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 120	150	200	350	≥500	Anchor spacing [mm]
75	13.4 (16.3)	14.6 (17.8)	16.2 (19.9)	16.5 (20.3)	16.5 (20.3)	100
100	17.2 (20.5)	18.7 (22.2)	20.5 (24.5)	22.2 (26.7)	22.2 (26.7)	
150	24.2 (26.9)	25.9 (28.7)	28.2 (30.9)	32.5 (35.0)	32.7 (35.4)	
≥200	28.9 (31.4)	30.7 (33.1)	33.0 (35.2)	36.9 (38.8)	38.7 (40.4)	
75	14.2 (16.8)	15.4 (18.2)	17.0 (20.2)	17.4 (20.6)	17.4 (20.6)	150
100	18.1 (20.5)	19.5 (22.1)	21.4 (24.1)	23.2 (26.1)	23.2 (26.1)	
150	23.8 (26.1)	25.5 (27.6)	27.5 (29.6)	31.3 (33.1)	31.4 (33.3)	
≥200	27.8 (29.9)	29.4 (31.3)	31.3 (33.1)	34.5 (36.1)	35.9 (37.3)	
75	14.7 (16.8)	15.9 (18.2)	17.6 (20.0)	17.9 (20.5)	17.9 (20.5)	200
100	18.3 (20.3)	19.7 (21.8)	21.6 (23.7)	23.4 (25.4)	23.4 (25.4)	
150	23.3 (25.3)	24.7 (26.7)	26.6 (28.4)	29.9 (31.5)	30.0 (31.7)	
≥200	26.8 (28.7)	28.1 (29.9)	29.8 (31.4)	32.6 (33.9)	33.8 (35.0)	
75	14.8 (16.5)	16.0 (17.9)	17.7 (19.6)	18.1 (20.0)	18.1 (20.0)	250
100	18.0 (19.9)	19.4 (21.2)	21.1 (23.0)	22.7 (24.5)	22.7 (24.5)	
150	22.6 (24.4)	24.0 (25.7)	25.6 (27.3)	28.6 (30.0)	28.8 (30.1)	
≥200	25.8 (27.5)	27.0 (28.6)	28.5 (29.9)	30.9 (32.1)	31.9 (33.1)	

Design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 120	150	200	350	≥500	Anchor spacing [mm]
75	16.1 (18.0)	17.5 (19.4)	19.3 (21.2)	19.7 (21.7)	19.7 (21.7)	100
100	19.8 (21.9)	21.2 (22.6)	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	
150	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	
≥200	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	
75	16.2 (18.1)	17.5 (19.4)	19.3 (21.2)	19.6 (21.5)	19.6 (21.5)	150
100	19.7 (21.6)	21.1 (22.6)	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	
150	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	
≥200	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	
75	16.2 (17.9)	17.4 (19.1)	19.0 (20.8)	19.4 (21.1)	19.4 (21.1)	200
100	19.4 (21.2)	20.6 (22.4)	22.3 (22.6)	22.6 (22.6)	22.6 (22.6)	
150	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	
≥200	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	
75	15.8 (17.5)	17.0 (18.7)	18.6 (20.2)	18.8 (20.5)	18.8 (20.5)	250
100	18.9 (20.6)	20.1 (21.8)	21.6 (22.6)	22.6 (22.6)	22.6 (22.6)	
150	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	
≥200	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	22.6 (22.6)	

$s_s \geq 85$ mm — Total design resistance [kN]

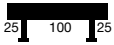
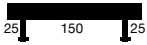
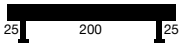
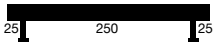
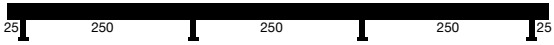
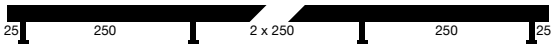
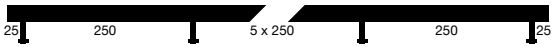
Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 120	150	200	350	≥500	Anchor spacing [mm]
75	17.2 (19.9)	18.6 (21.5)	20.6 (23.7)	21.0 (24.3)	21.0 (24.3)	100
100	21.9 (24.3)	23.6 (26.1)	25.9 (28.4)	28.1 (30.6)	28.1 (30.6)	
150	28.2 (30.7)	30.0 (32.5)	32.3 (34.5)	36.3 (38.3)	36.6 (38.5)	
≥200	32.7 (35.0)	34.4 (36.5)	36.4 (38.3)	39.9 (41.4)	41.3 (42.6)	
75	17.9 (20.0)	19.4 (21.6)	21.4 (23.7)	21.9 (24.1)	21.9 (24.1)	150
100	21.7 (23.9)	23.3 (25.6)	25.4 (27.6)	27.3 (29.4)	27.3 (29.4)	
150	27.3 (29.4)	28.8 (30.9)	30.7 (32.6)	34.1 (35.7)	34.4 (35.9)	
≥200	31.1 (33.0)	32.5 (34.2)	34.1 (35.7)	36.9 (38.1)	38.0 (39.4)	
75	17.9 (19.9)	19.4 (21.3)	21.2 (23.2)	21.6 (23.7)	21.6 (23.7)	200
100	21.4 (23.5)	22.9 (24.9)	24.8 (26.8)	26.5 (28.4)	26.5 (28.4)	
150	26.4 (28.3)	27.8 (29.5)	29.4 (31.1)	32.3 (33.7)	32.5 (33.8)	
≥200	29.7 (31.3)	30.8 (32.4)	32.3 (33.7)	34.6 (35.9)	35.7 (37.1)	
75	17.6 (19.4)	18.9 (20.8)	20.7 (22.6)	21.1 (23.0)	21.1 (23.0)	250
100	20.9 (22.8)	22.3 (24.1)	24.0 (25.8)	25.6 (27.2)	25.6 (27.2)	
150	25.5 (27.1)	26.7 (28.3)	28.1 (29.6)	30.7 (31.9)	30.8 (31.9)	
≥200	28.3 (29.8)	29.4 (30.7)	30.6 (31.9)	32.6 (34.0)	33.8 (35.0)	

() values in parenthesis for uncracked concrete

() values in parenthesis for uncracked concrete

() values in parenthesis for uncracked concrete

HAC-50 anchor channel

Channel length [mm]	Anchor spacing [mm]	Number of anchors [pcs]	
150	100	2	
200	150	2	
250	200	2	
300	250	2	
350	150	3	
450	200	3	
550	250	3	
800	250	4	
1050	250	5	
1300	250	6	
1550	250	7	
1800	250	8	
2050	250	9	
2300	250	10	
5800	250	24	

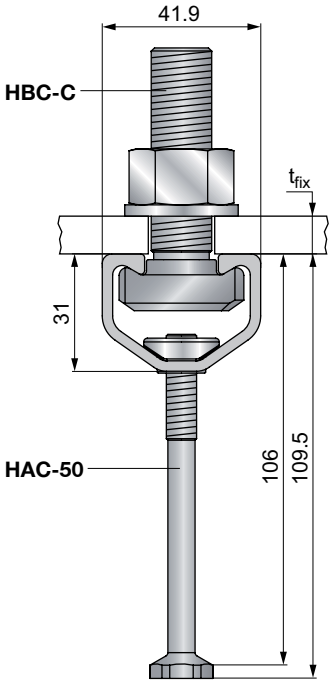
Other anchor channel lengths on request.

Minimum requirements

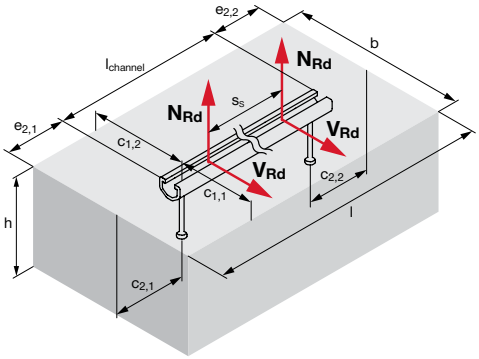
Dimensions	[mm]
$c_{1,i}$	75
h	110 + c
b	150
l	100 + $l_{channel}$
c = concrete cover according to DIN EN 1992-1-1:2005	

Edge distance $c_{1,1}$ [mm] $c_{1,2} \geq c_{1,1}$	Minimum corner distance min $c_{2,1}$; min $c_{2,2}$ [mm]
75	216
100	242
150	342
200	442

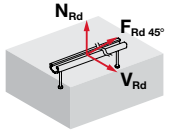
	Bolt length [mm]	Clamping length t_{fix} [mm]
M10	30	10
	40	20
	50	30
	60	40
	70	50
	80	60
	100	80
M12	30	7
	40	17
	50	27
	60	37
	80	57
	100	77
	125	102
	150	127
M16	30	2
	40	12
	50	22
	60	32
	65	37
	70	42
	80	52
	100	72
	125	97
	150	122
	200	172
	290	262
M20	50	17
	60	27
	80	47
	100	67
	125	92
	150	117

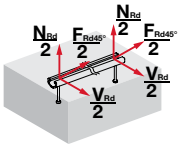


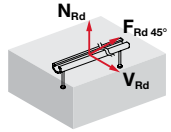
HBC-C [kN]				
		$N_{Rd.s}$	$V_{Rd.s}$	$F_{Rd.s.45°}$
M10	4.6	11.60	8.32	10.09
	A4-50	10.14	7.31	8.87
M12	4.6	16.85	12.10	14.70
	A4-50	14.74	10.63	12.89
M16	4.6	31.34	22.51	27.36
	8.8	83.57	50.16	66.24
	A4-50	27.42	19.75	23.89
M20	4.6	49.00	35.21	42.66
	8.8	130.67	78.32	103.48
	A4-50	42.83	30.84	37.32



HAC-60 design tables







C25/30 concrete grade

N_{Rd} – Design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 165	200	300	400	≥500	Anchor spacing [mm]
100	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	150
150	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
200	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
≥250	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
100	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	200
150	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
200	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
≥250	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
100	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	250
150	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
200	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
≥250	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
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N_{Rd} – $s_s \geq 90$ mm Total design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 165	200	300	400	≥500	Anchor spacing [mm]
100	40.8 (48.3)	40.8 (50.0)	40.8 (50.0)	40.8 (50.0)	40.8 (50.0)	150
150	50.0 (50.0)	50.0 (50.0)	50.0 (50.0)	50.0 (50.0)	50.0 (50.0)	
200	50.0 (50.0)	50.0 (50.0)	50.0 (50.0)	50.0 (50.0)	50.0 (50.0)	
≥250	50.0 (50.0)	50.0 (50.0)	50.0 (50.0)	50.0 (50.0)	50.0 (50.0)	
100	42.0 (46.1)	42.0 (46.1)	42.0 (46.1)	42.0 (46.1)	42.0 (46.1)	200
150	46.1 (46.1)	46.1 (46.1)	46.1 (46.1)	46.1 (46.1)	46.1 (46.1)	
200	46.1 (46.1)	46.1 (46.1)	46.1 (46.1)	46.1 (46.1)	46.1 (46.1)	
≥250	46.1 (46.1)	46.1 (46.1)	46.1 (46.1)	46.1 (46.1)	46.1 (46.1)	
100	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	250
150	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	
200	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	
≥250	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	
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V_{Rd} – Design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 165	200	300	400	≥500	Anchor spacing [mm]
100	15.8 (18.3)	17.3 (20.2)	20.1 (23.6)	20.1 (23.6)	20.1 (23.6)	150
150	23.7 (27.7)	26.1 (30.5)	32.0 (37.1)	35.6 (37.1)	35.6 (37.1)	
200	31.7 (37.0)	34.9 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	
≥250	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	
100	16.0 (18.7)	17.6 (20.6)	20.5 (23.9)	20.5 (23.9)	20.5 (23.9)	200
150	24.0 (28.1)	26.5 (30.9)	32.5 (37.1)	36.1 (37.1)	36.1 (37.1)	
200	32.0 (37.1)	35.3 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	
≥250	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	
100	16.1 (18.7)	17.7 (20.6)	20.6 (24.0)	20.6 (24.0)	20.6 (24.0)	250
150	24.2 (28.2)	26.6 (31.0)	32.6 (37.1)	36.1 (37.1)	36.1 (37.1)	
200	32.2 (37.1)	35.4 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	
≥250	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	
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V_{Rd} – $s_s \geq 90$ mm Total design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 165	200	300	400	≥500	Anchor spacing [mm]
100	16.6 (19.4)	18.3 (21.4)	21.4 (24.9)	21.4 (24.9)	21.4 (24.9)	150
150	24.7 (28.8)	27.1 (31.7)	33.2 (38.8)	37.0 (43.2)	37.0 (43.2)	
200	32.7 (38.1)	35.9 (42.0)	43.9 (51.2)	50.8 (59.3)	55.1 (64.4)	
≥250	40.5 (47.3)	44.7 (52.2)	54.7 (63.9)	63.2 (73.7)	70.8 (74.2)	
100	17.2 (20.0)	18.9 (22.0)	22.0 (25.6)	22.0 (25.6)	22.0 (25.6)	200
150	25.3 (29.4)	27.8 (32.5)	33.9 (39.7)	37.8 (44.2)	37.8 (44.2)	
200	33.2 (38.8)	36.6 (42.7)	44.9 (52.2)	51.7 (60.3)	56.1 (65.4)	
≥250	41.2 (48.1)	45.4 (53.0)	55.6 (64.9)	64.2 (74.2)	71.7 (74.2)	
100	17.4 (20.3)	19.2 (22.3)	22.3 (26.0)	22.3 (26.0)	22.3 (26.0)	250
150	25.5 (29.8)	28.1 (32.8)	34.4 (40.1)	38.3 (44.7)	38.3 (44.7)	
200	33.6 (39.2)	37.0 (43.2)	45.1 (52.7)	52.2 (61.0)	56.6 (66.1)	
≥250	41.5 (48.6)	45.6 (53.4)	56.1 (65.4)	64.7 (74.2)	72.2 (74.2)	
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$F_{Rd\ 45°}$ – Design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 165	200	300	400	≥500	Anchor spacing [mm]
100	19.1 (21.9)	20.6 (23.6)	23.1 (26.3)	23.1 (26.3)	23.1 (26.3)	150
150	26.5 (29.4)	28.3 (31.3)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
200	32.0 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
≥250	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
100	19.4 (21.9)	21.0 (23.6)	23.5 (26.2)	23.5 (26.2)	23.5 (26.2)	200
150	26.2 (29.0)	28.0 (30.8)	31.7 (32.2)	32.2 (32.2)	32.2 (32.2)	
200	31.4 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
≥250	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
100	19.3 (21.7)	20.7 (23.2)	23.2 (25.8)	23.2 (25.8)	23.2 (25.8)	250
150	25.9 (28.5)	27.5 (30.1)	31.0 (32.2)	32.2 (32.2)	32.2 (32.2)	
200	30.7 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
≥250	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
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$F_{Rd\ 45°}$ – $s_s \geq 90$ mm Total design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 165	200	300	400	≥500	Anchor spacing [mm]
100	20.2 (23.7)	21.8 (25.7)	24.4 (28.8)	24.4 (28.8)	24.4 (28.8)	150
150	28.7 (32.0)	30.7 (34.2)	35.2 (38.8)	37.7 (41.3)	37.7 (41.3)	
200	34.9 (38.4)	37.1 (40.7)	41.8 (45.2)	45.0 (48.3)	46.8 (50.0)	
≥250	39.9 (43.4)	42.1 (45.6)	46.6 (49.9)	49.7 (52.8)	51.9 (54.7)	
100	20.8 (23.9)	22.5 (25.7)	25.1 (28.8)	25.1 (28.8)	25.1 (28.8)	200
150	28.5 (31.6)	30.4 (33.7)	34.7 (38.0)	36.9 (40.2)	36.9 (40.2)	
200	34.2 (37.5)	36.3 (39.5)	40.5 (43.7)	43.4 (46.4)	45.0 (47.8)	
≥250	38.8 (41.9)	40.7 (43.8)	44.8 (47.6)	47.5 (50.0)	49.4 (51.9)	
100	21.1 (23.8)	22.7 (25.6)	25.5 (28.4)	25.5 (28.4)	25.5 (28.4)	250
150	28.1 (31.1)	30.0 (33.0)	33.9 (36.9)	36.0 (39.0)	36.0 (39.0)	
200	33.4 (36.4)	35.3 (38.3)	39.2 (42.0)	41.9 (44.5)	43.3 (45.7)	
≥250	37.6 (40.5)	39.4 (42.3)	43.1 (45.6)	45.4 (47.8)	47.1 (49.4)	
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() values in parenthesis for uncracked concrete

C30/37 concrete grade

N_{Rd} – Design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 165	200	300	400	≥500	Anchor spacing [mm]
100	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	150
150	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
200	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
≥250	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
100	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	200
150	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
200	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
≥250	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
100	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	250
150	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
200	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
≥250	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
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V_{Rd} – Design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 165	200	300	400	≥500	Anchor spacing [mm]
100	17.5 (20.4)	19.2 (22.5)	22.3 (26.1)	22.3 (26.1)	22.3 (26.1)	150
150	26.4 (30.8)	29.0 (33.8)	35.5 (37.1)	37.1 (37.1)	37.1 (37.1)	
200	35.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	
≥250	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	
100	17.8 (20.8)	19.5 (22.8)	22.8 (26.6)	22.8 (26.6)	22.8 (26.6)	200
150	26.7 (31.1)	29.4 (34.3)	36.0 (37.1)	37.1 (37.1)	37.1 (37.1)	
200	35.6 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	
≥250	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	
100	17.8 (20.9)	19.7 (23.0)	22.8 (26.7)	22.8 (26.7)	22.8 (26.7)	250
150	26.9 (31.2)	29.5 (34.4)	36.1 (37.1)	37.1 (37.1)	37.1 (37.1)	
200	35.6 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	
≥250	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	
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$F_{Rd\ 45°}$ – Design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 165	200	300	400	≥500	Anchor spacing [mm]
100	21.1 (23.7)	22.7 (25.5)	25.5 (28.3)	25.5 (28.3)	25.5 (28.3)	150
150	28.5 (31.4)	30.3 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
200	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
≥250	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
100	21.1 (23.7)	22.7 (25.4)	25.3 (28.1)	25.3 (28.1)	25.3 (28.1)	200
150	28.1 (31.0)	29.9 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
200	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
≥250	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
100	20.9 (23.4)	22.5 (25.0)	25.0 (27.5)	25.0 (27.5)	25.0 (27.5)	250
150	27.6 (30.3)	29.4 (31.9)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
200	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
≥250	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
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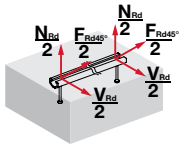
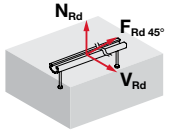
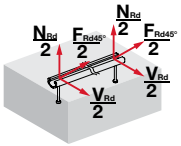
() values in parenthesis for uncracked concrete







C50/60 concrete grade

N_{Rd}

Edge distance $c_{1,1}$ [mm]	$s_s \geq 90$ mm: Member thickness h [mm] 165	200	300	400	≥500	Anchor spacing [mm]
100	47.3 (53.2)	47.3 (53.2)	47.3 (53.2)	47.3 (53.2)	47.3 (53.2)	150
150	53.2 (53.2)	53.2 (53.2)	53.2 (53.2)	53.2 (53.2)	53.2 (53.2)	
200	53.2 (53.2)	53.2 (53.2)	53.2 (53.2)	53.2 (53.2)	53.2 (53.2)	
≥250	53.2 (53.2)	53.2 (53.2)	53.2 (53.2)	53.2 (53.2)	53.2 (53.2)	
100	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	200
150	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	
200	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	
≥250	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	
100	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	250
150	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	
200	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	
≥250	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	
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V_{Rd}

Edge distance $c_{1,1}$ [mm]	$s_s \geq 90$ mm: Member thickness h [mm] 165	200	300	400	≥500	Anchor spacing [mm]
100	19.4 (22.6)	21.4 (24.9)	24.8 (28.9)	24.8 (28.9)	24.8 (28.9)	150
150	28.3 (33.1)	31.2 (36.4)	38.2 (44.7)	42.5 (49.5)	42.5 (49.5)	
200	37.2 (43.4)	41.0 (47.8)	50.3 (58.6)	58.1 (67.6)	63.0 (73.2)	
≥250	46.1 (53.7)	50.8 (59.0)	62.0 (72.5)	71.7 (74.2)	74.2 (74.2)	
100	19.2 (22.4)	21.1 (24.7)	24.7 (28.7)	24.7 (28.7)	24.7 (28.7)	200
150	28.2 (33.0)	31.0 (36.1)	38.1 (44.4)	42.2 (49.3)	42.2 (49.3)	
200	37.1 (43.2)	40.8 (47.6)	50.0 (58.3)	57.6 (67.3)	62.7 (73.2)	
≥250	45.9 (53.7)	50.5 (59.0)	62.0 (72.2)	71.5 (74.2)	74.2 (74.2)	
100	19.3 (22.6)	21.2 (24.8)	24.8 (28.9)	24.8 (28.9)	24.8 (28.9)	250
150	28.3 (33.1)	31.2 (36.4)	38.3 (44.7)	42.5 (49.5)	42.5 (49.5)	
200	37.3 (43.4)	41.0 (47.8)	50.3 (58.6)	58.1 (67.8)	63.0 (73.4)	
≥250	46.1 (53.9)	50.8 (59.3)	62.2 (72.7)	71.7 (74.2)	74.2 (74.2)	
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$F_{Rd\ 45°}$

Edge distance $c_{1,1}$ [mm]	$s_s \geq 90$ mm: Member thickness h [mm] 165	200	300	400	≥500	Anchor spacing [mm]
100	23.5 (27.2)	25.3 (29.3)	28.4 (32.7)	28.4 (32.7)	28.4 (32.7)	150
150	32.2 (35.9)	34.4 (38.1)	39.4 (43.2)	41.9 (45.7)	41.9 (45.7)	
200	38.7 (42.5)	41.1 (44.9)	46.1 (49.7)	49.4 (52.8)	51.3 (54.5)	
≥250	44.0 (47.6)	46.3 (49.9)	50.9 (54.4)	54.2 (57.3)	56.4 (59.4)	
100	23.2 (26.2)	25.0 (28.1)	28.0 (31.2)	28.0 (31.2)	28.0 (31.2)	200
150	30.8 (34.0)	32.8 (36.1)	37.1 (40.4)	39.4 (42.6)	39.4 (42.6)	
200	36.6 (39.9)	38.7 (41.9)	42.9 (45.9)	45.7 (48.5)	47.3 (50.0)	
≥250	41.2 (44.3)	43.2 (46.1)	47.1 (49.7)	49.5 (52.1)	51.4 (53.7)	
100	22.9 (25.7)	24.6 (27.5)	27.5 (30.5)	27.5 (30.5)	27.5 (30.5)	250
150	30.1 (33.1)	31.9 (35.0)	36.0 (38.9)	38.0 (40.9)	38.0 (40.9)	
200	35.5 (38.5)	37.4 (40.2)	41.2 (43.8)	43.7 (46.2)	45.0 (47.5)	
≥250	39.5 (42.4)	41.3 (44.0)	44.9 (47.3)	47.1 (49.2)	48.7 (50.6)	
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() values in parenthesis for uncracked concrete

N_{Rd}

Edge distance $c_{1,1}$ [mm]	Design resistance [kN]: Member thickness h [mm] 165	200	300	400	≥500	Anchor spacing [mm]
100	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	150
150	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
200	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
≥250	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
100	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	200
150	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
200	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
≥250	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
100	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	250
150	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
200	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
≥250	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	28.8 (28.8)	
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V_{Rd}

Edge distance $c_{1,1}$ [mm]	Design resistance [kN]: Member thickness h [mm] 165	200	300	400	≥500	Anchor spacing [mm]
100	22.2 (26.0)	24.5 (28.6)	28.6 (33.2)	28.6 (33.2)	28.6 (33.2)	150
150	33.6 (37.1)	36.9 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	
200	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	
≥250	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	
100	22.7 (26.4)	24.9 (29.0)	29.0 (33.9)	29.0 (33.9)	29.0 (33.9)	200
150	33.9 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	
200	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	
≥250	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	
100	22.7 (26.5)	25.0 (29.2)	29.2 (33.9)	29.2 (33.9)	29.2 (33.9)	250
150	34.2 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	
200	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	
≥250	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	37.1 (37.1)	
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$F_{Rd\ 45°}$

Edge distance $c_{1,1}$ [mm]	Design resistance [kN]: Member thickness h [mm] 165	200	300	400	≥500	Anchor spacing [mm]
100	25.3 (28.2)	27.1 (30.0)	30.0 (32.2)	30.0 (32.2)	30.0 (32.2)	150
150	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
200	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
≥250	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
100	25.2 (28.0)	26.9 (29.7)	29.7 (32.2)	29.7 (32.2)	29.7 (32.2)	200
150	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
200	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
≥250	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
100	24.9 (27.5)	26.5 (29.1)	29.1 (31.8)	29.1 (31.8)	29.1 (31.8)	250
150	31.8 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
200	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
≥250	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	32.2 (32.2)	
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() values in parenthesis for uncracked concrete

N_{Rd}

Edge distance $c_{1,1}$ [mm]	$s_s \geq 90$ mm: Member thickness h [mm] 165	200	300	400	≥500	Anchor spacing [mm]
100	53.2 (53.2)	53.2 (53.2)	53.2 (53.2)	53.2 (53.2)	53.2 (53.2)	150
150	53.2 (53.2)	53.2 (53.2)	53.2 (53.2)	53.2 (53.2)	53.2 (53.2)	
200	53.2 (53.2)	53.2 (53.2)	53.2 (53.2)	53.2 (53.2)	53.2 (53.2)	
≥250	53.2 (53.2)	53.2 (53.2)	53.2 (53.2)	53.2 (53.2)	53.2 (53.2)	
100	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	200
150	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	
200	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	
≥250	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	46.4 (46.4)	
100	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	250
150	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	
200	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	
≥250	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	42.7 (42.7)	
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V_{Rd}

Edge distance $c_{1,1}$ [mm]	$s_s \geq 90$ mm: Member thickness h [mm] 165	200	300	400	≥500	Anchor spacing [mm]
100	24.7 (28.8)	27.1 (31.7)	31.6 (36.9)	31.6 (36.9)	31.6 (36.9)	150
150	36.1 (42.1)	39.8 (46.4)	48.6 (56.6)	54.2 (63.0)	54.2 (63.0)	
200	47.3 (55.1)	52.2 (61.0)	63.9 (74.2)	73.7 (74.2)	74.2 (74.2)	
≥250	58.6 (68.3)	64.4 (74.2)	74.2 (74.2)	74.2 (74.2)	74.2 (74.2)	
100	24.4 (28.6)	26.9 (31.4)	31.4 (36.6)	31.4 (36.6)	31.4 (36.6)	200
150	35.9 (41.9)	39.5 (46.1)	48.3 (56.4)	53.7 (62.7)	53.7 (62.7)	
200	47.1 (55.1)	52.0 (60.5)	63.7 (74.2)	73.4 (74.2)	74.2 (74.2)	
≥250	58.6 (68.3)	64.4 (74.2)	74.2 (74.2)	74.2 (74.2)	74.2 (74.2)	
100	24.7 (28.7)	27.1 (31.6)	31.5 (36.9)	31.5 (36.9)	31.5 (36.9)	250
150	36.1 (42.2)	39.8 (46.4)	48.6 (56.9)	54.2 (63.2)	54.2 (63.2)	
200	47.5 (55.4)	52.2 (61.0)	63.9 (74.2)	73.9 (74.2)	74.2 (74.2)	
≥250	58.8 (68.6)	64.7 (74.2)	74.2 (74.2)	74.2 (74.2)	74.2 (74.2)	
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$F_{Rd\ 45°}$

Edge distance $c_{1,1}$ [mm]	$s_s \geq 90$ mm: Member thickness h [mm] 165	200	300	400	≥500	Anchor spacing [mm]
100	29.1 (32.5)	31.3 (34.9)	34.8 (38.5)	34.8 (38.5)	34.8 (38.5)	150
150	38.0 (41.8)	40.3 (44.1)	45.2 (48.8)	47.8 (51.4)	47.8 (51.4)	
200	44.7 (48.3)	46.9 (50.6)	51.6 (54.9)	54.7 (57.8)	56.4 (59.4)	
≥250	49.7 (53.2)	51.9 (55.2)	56.1 (59.0)	58.8 (61.4)	60.7 (63.2)	
100	27.9 (31.1)	29.9 (33.1)	33.1 (36.3)	33.1 (36.3)	33.1 (36.3)	200
150	35.9 (39.2)	38.0 (41.3)	42.3 (45.2)	44.4 (47.3)	44.4 (47.3)	
200	41.8 (44.9)	43.7 (46.6)	47.5 (50.2)	50.0 (52.5)	51.4 (53.7)	
≥250	45.9 (48.8)	47.8 (50.4)	51.3 (53.5)	53.3 (55.4)	54.9 (56.8)	
100	27.4 (30.4)	29.2 (32.3)	32.2 (35.2)	32.2 (35.2)	32.2 (35.2)	250
150	34.9 (37.8)	36.8 (39.7)	40.6 (43.3)	42.5 (45.0)	42.5 (45.0)	
200	40.0 (42.8)	41.9 (44.5)	45.2 (47.6)	47.5 (49.5)	48.7 (50.6)	
≥250	43.8 (46.4)	45.4 (47.8)	48.5 (50.4)	50.4 (52.1)	51.6 (53.5)	
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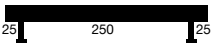
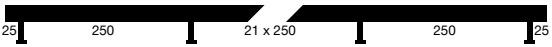
() values in parenthesis for uncracked concrete

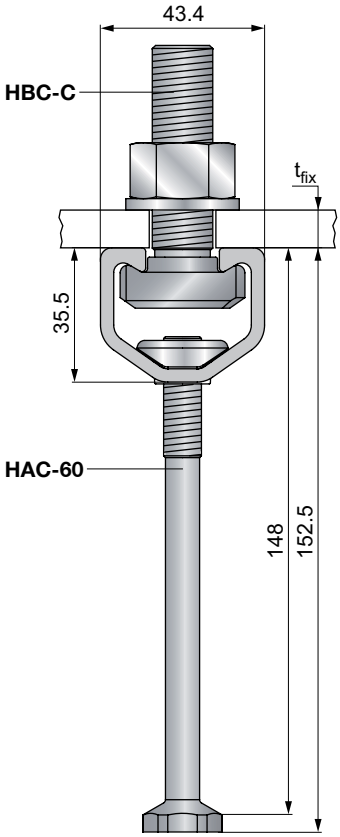
Channel length [mm]	Anchor spacing [mm]	Number of anchors [pcs]	
300	250	2	
350	150	3	
450	200	3	
550	250	3	
1050	250	5	
1300	250	6	
1550	250	7	
2300	250	10	
5800	250	24	
Other anchor channel lengths on request.			

Minimum requirements

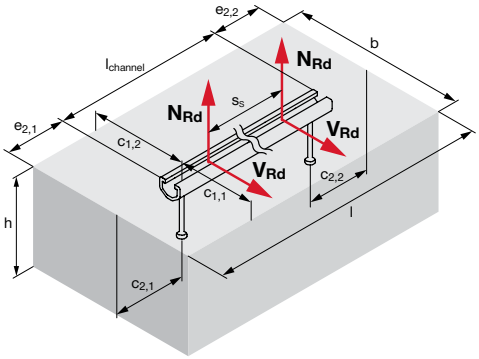
Dimensions	[mm]
$c_{1,i}$	100
h	153 + c
b	200
l	150 + $l_{channel}$
c = concrete cover according to DIN EN 1992-1-1:2005	

Edge distance $c_{1,1}$ [mm] $c_{1,2} \geq c_{1,1}$	Minimum corner distance min $c_{2,1}$; min $c_{2,2}$ [mm]
100	256
150	344
200	444
250	544

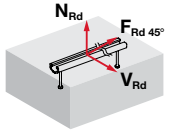
	Bolt length [mm]	Clamping length t_{fix} [mm]
M10	30	9
	40	19
	50	29
	60	39
	70	49
	80	59
	100	79
M12	30	6
	40	16
	50	26
	60	36
	80	56
	100	76
	125	101
	150	126
M16	30	1
	40	11
	50	21
	60	31
	65	36
	70	41
	80	51
	100	71
	125	96
	150	121
	200	171
	290	261
M20	50	16
	60	26
	80	46
	100	66
	125	91
	150	116

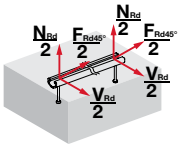


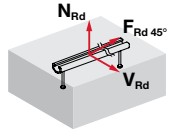
HBC-C [kN]				
		$N_{Rd.s}$	$V_{Rd.s}$	$F_{Rd.s.45°}$
M10	4.6	11.60	8.32	10.09
	A4-50	10.14	7.31	8.87
M12	4.6	16.85	12.10	14.70
	A4-50	14.74	10.63	12.89
M16	4.6	31.34	22.51	27.36
	8.8	83.57	50.16	66.24
	A4-50	27.42	19.75	23.89
M20	4.6	49.00	35.21	42.66
	8.8	130.67	78.32	103.48
	A4-50	42.83	30.84	37.32



HAC-70 design tables







C25/30 concrete grade

Design resistance [kN]

N_{Rd}	Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 190	200	300	400	≥500	Anchor spacing [mm]
	100	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	150
	150	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
	200	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
	≥250	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
	100	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	200
	150	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
	200	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
	≥250	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
	100	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	250
	150	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
	200	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
	≥250	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
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$s_s \geq 100$ mm Total design resistance [kN]

N_{Rd}	Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 190	200	300	400	≥500	Anchor spacing [mm]
	100	52.5 (63.9)	52.5 (65.9)	52.5 (72.2)	52.5 (72.2)	52.5 (72.2)	150
	150	64.4 (72.2)	64.4 (72.2)	64.4 (72.2)	64.4 (72.2)	64.4 (72.2)	
	200	72.2 (72.2)	72.2 (72.2)	72.2 (72.2)	72.2 (72.2)	72.2 (72.2)	
	≥250	72.2 (72.2)	72.2 (72.2)	72.2 (72.2)	72.2 (72.2)	72.2 (72.2)	
	100	54.2 (65.9)	54.2 (66.4)	54.2 (66.4)	54.2 (66.4)	54.2 (66.4)	200
	150	66.4 (66.4)	66.4 (66.4)	66.4 (66.4)	66.4 (66.4)	66.4 (66.4)	
	200	66.4 (66.4)	66.4 (66.4)	66.4 (66.4)	66.4 (66.4)	66.4 (66.4)	
	≥250	66.4 (66.4)	66.4 (66.4)	66.4 (66.4)	66.4 (66.4)	66.4 (66.4)	
	100	55.1 (61.5)	55.1 (61.5)	55.1 (61.5)	55.1 (61.5)	55.1 (61.5)	250
	150	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	
	200	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	
	≥250	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	
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Design resistance [kN]

V_{Rd}	Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 190	200	300	400	≥500	Anchor spacing [mm]
	100	16.6 (19.4)	17.1 (19.9)	20.2 (23.6)	20.2 (23.6)	20.2 (23.6)	150
	150	25.1 (29.4)	25.9 (30.1)	31.6 (36.9)	35.6 (41.5)	35.6 (41.5)	
	200	33.7 (39.3)	34.7 (40.3)	42.5 (43.7)	43.7 (43.7)	43.7 (43.7)	
	≥250	42.2 (43.7)	43.4 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	
	100	17.0 (19.8)	17.4 (20.3)	20.6 (24.0)	20.6 (24.0)	20.6 (24.0)	200
	150	25.6 (29.8)	26.2 (30.6)	32.1 (37.5)	36.1 (42.2)	36.1 (42.2)	
	200	34.2 (39.8)	35.0 (40.8)	43.0 (43.7)	43.7 (43.7)	43.7 (43.7)	
	≥250	42.7 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	
	100	17.1 (19.9)	17.5 (20.5)	20.8 (24.2)	20.8 (24.2)	20.8 (24.2)	250
	150	25.8 (30.0)	26.4 (30.8)	32.3 (37.7)	36.4 (42.5)	36.4 (42.5)	
	200	34.3 (40.0)	35.1 (41.0)	43.2 (43.7)	43.7 (43.7)	43.7 (43.7)	
	≥250	43.0 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	
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$s_s \geq 100$ mm Total design resistance [kN]

V_{Rd}	Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 190	200	300	400	≥500	Anchor spacing [mm]
	100	17.7 (20.6)	18.1 (21.1)	21.5 (25.0)	21.5 (25.0)	21.5 (25.0)	150
	150	26.2 (30.6)	27.0 (31.5)	33.0 (38.6)	37.1 (43.3)	37.1 (43.3)	
	200	34.8 (40.5)	35.6 (41.7)	43.7 (51.0)	50.5 (59.0)	55.4 (64.4)	
	≥250	43.4 (50.5)	44.4 (52.0)	54.4 (63.4)	63.0 (73.4)	70.3 (82.0)	
	100	18.3 (21.4)	18.7 (21.9)	22.2 (25.9)	22.2 (25.9)	22.2 (25.9)	200
	150	26.9 (31.4)	27.6 (32.2)	33.8 (39.5)	38.1 (44.4)	38.1 (44.4)	
	200	35.5 (41.5)	36.4 (42.5)	44.7 (52.0)	51.5 (60.0)	56.4 (65.9)	
	≥250	44.0 (51.5)	45.1 (52.7)	55.4 (64.7)	63.9 (74.7)	71.5 (83.4)	
	100	18.6 (21.7)	19.0 (22.2)	22.6 (26.4)	22.6 (26.4)	22.6 (26.4)	250
	150	27.3 (31.9)	28.1 (32.7)	34.3 (40.0)	38.6 (45.1)	38.6 (45.1)	
	200	35.9 (42.0)	36.9 (43.0)	45.1 (52.7)	52.2 (60.8)	57.1 (66.6)	
	≥250	44.4 (52.0)	45.6 (53.2)	55.9 (65.4)	64.4 (75.1)	72.2 (84.4)	
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Design resistance [kN]

$F_{Rd\ 45°}$	Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 190	200	300	400	≥500	Anchor spacing [mm]
	100	21.2 (24.9)	21.6 (25.3)	24.5 (28.8)	24.5 (28.8)	24.5 (28.8)	150
	150	30.3 (34.1)	30.9 (34.7)	36.0 (40.0)	39.1 (42.1)	39.1 (42.1)	
	200	37.6 (41.8)	38.3 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	
	≥250	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	
	100	21.6 (24.9)	22.0 (25.3)	25.0 (28.8)	25.0 (28.8)	25.0 (28.8)	200
	150	30.3 (33.9)	30.9 (34.5)	35.7 (39.7)	38.8 (42.1)	38.8 (42.1)	
	200	37.3 (41.3)	38.0 (41.9)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	
	≥250	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	
	100	21.8 (24.6)	22.1 (25.1)	25.1 (28.7)	25.1 (28.7)	25.1 (28.7)	250
	150	30.0 (33.6)	30.6 (34.2)	35.3 (39.0)	38.1 (41.9)	38.1 (41.9)	
	200	36.8 (40.6)	37.4 (41.2)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	
	≥250	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	
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$s_s \geq 100$ mm Total design resistance [kN]

$F_{Rd\ 45°}$	Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 190	200	300	400	≥500	Anchor spacing [mm]
	100	22.5 (26.4)	22.9 (27.2)	26.0 (31.6)	26.0 (31.6)	26.0 (31.6)	150
	150	31.9 (36.9)	32.5 (37.6)	37.9 (43.8)	41.3 (47.5)	41.3 (47.5)	
	200	40.7 (45.4)	41.4 (46.3)	47.8 (53.0)	52.6 (57.6)	55.6 (60.7)	
	≥250	47.6 (52.6)	48.3 (53.5)	55.1 (60.2)	59.9 (64.9)	63.5 (68.3)	
	100	23.1 (27.3)	23.7 (28.0)	26.9 (31.7)	26.9 (31.7)	26.9 (31.7)	200
	150	32.6 (36.8)	33.3 (37.5)	38.9 (43.4)	42.3 (46.9)	42.3 (46.9)	
	200	40.3 (44.9)	41.1 (45.6)	47.1 (51.8)	51.4 (56.1)	54.2 (58.8)	
	≥250	46.8 (51.4)	47.5 (52.1)	53.7 (58.3)	58.0 (62.5)	61.3 (65.6)	
	100	23.6 (27.3)	24.0 (27.8)	27.4 (31.6)	27.4 (31.6)	27.4 (31.6)	250
	150	32.5 (36.5)	33.1 (37.2)	38.5 (42.8)	41.8 (46.1)	41.8 (46.1)	
	200	39.8 (44.0)	40.5 (44.9)	46.3 (50.6)	50.2 (54.5)	52.8 (57.1)	
	≥250	45.7 (50.2)	46.5 (50.9)	52.3 (56.4)	56.3 (60.2)	59.2 (63.2)	
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() values in parenthesis for uncracked concrete

C30/37 concrete grade

Design resistance [kN]

N_{Rd}	Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 190	200	300	400	≥500	Anchor spacing [mm]
	100	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	150
	150	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
	200	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
	≥250	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
	100	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	200
	150	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
	200	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
	≥250	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
	100	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	250
	150	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
	200	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
	≥250	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
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Design resistance [kN]

V_{Rd}	Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 190	200	300	400	≥500	Anchor spacing [mm]
	100	18.4 (21.6)	18.9 (22.1)	22.5 (26.1)	22.5 (26.1)	22.5 (26.1)	150
	150	28.0 (32.7)	28.7 (33.4)	35.1 (41.0)	39.5 (43.7)	39.5 (43.7)	
	200	37.5 (43.7)	38.3 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	
	≥250	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	
	100	18.9 (22.0)	19.4 (22.6)	22.9 (26.7)	22.9 (26.7)	22.9 (26.7)	200
	150	28.4 (33.2)	29.2 (33.9)	35.6 (41.7)	40.1 (43.7)	40.1 (43.7)	
	200	37.8 (43.7)	38.8 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	
	≥250	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	
	100	18.9 (22.1)	19.5 (22.7)	23.1 (26.9)	23.1 (26.9)	23.1 (26.9)	250
	150	28.6 (33.3)	29.3 (34.2)	35.9 (42.0)	40.4 (43.7)	40.4 (43.7)	
	200	38.1 (43.7)	39.0 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	
	≥250	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	
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Design resistance [kN]

$F_{Rd\ 45°}$	Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 190	200	300	400	≥500	Anchor spacing [mm]
	100	23.5 (26.9)	24.0 (27.4)	27.2 (31.3)	27.2 (31.3)	27.2 (31.3)	150
	150	32.8 (36.8)	33.5 (37.5)	38.8 (42.1)	41.9 (42.1)	41.9 (42.1)	
	200	40.4 (42.1)	41.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	
	≥250	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	
	100	24.0 (26.9)	24.4 (27.5)	27.8 (31.3)	27.8 (31.3)	27.8 (31.3)	200
	150	32.7 (36.6)	33.3 (37.2)	38.4 (42.1)	41.4 (42.1)	41.4 (42.1)	
	200	40.0 (42.1)	40.6 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	
	≥250	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	
	100	23.7 (26.8)	24.2 (27.3)	27.5 (31.0)	27.5 (31.0)	27.5 (31.0)	250
	150	32.5 (36.1)	33.0 (36.7)	37.8 (41.6)	40.7 (42.1)	40.7 (42.1)	
	200	39.4 (42.1)	40.0 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	
	≥250	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	
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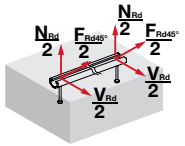
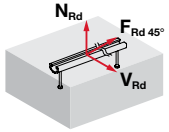
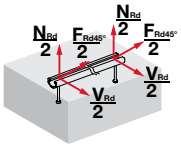
() values in parenthesis for uncracked concrete







C50/60 concrete grade

N_{Rd} — $s_s \geq 100$ mm — Total design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 190	200	300	400	≥500	Anchor spacing [mm]
100	61.0 (77.1)	61.0 (77.1)	61.0 (77.1)	61.0 (77.1)	61.0 (77.1)	150
150	74.7 (77.1)	74.7 (77.1)	74.7 (77.1)	74.7 (77.1)	74.7 (77.1)	
200	77.1 (77.1)	77.1 (77.1)	77.1 (77.1)	77.1 (77.1)	77.1 (77.1)	
≥250	77.1 (77.1)	77.1 (77.1)	77.1 (77.1)	77.1 (77.1)	77.1 (77.1)	
100	61.5 (67.8)	61.5 (67.8)	61.5 (67.8)	61.5 (67.8)	61.5 (67.8)	200
150	67.8 (67.8)	67.8 (67.8)	67.8 (67.8)	67.8 (67.8)	67.8 (67.8)	
200	67.8 (67.8)	67.8 (67.8)	67.8 (67.8)	67.8 (67.8)	67.8 (67.8)	
≥250	67.8 (67.8)	67.8 (67.8)	67.8 (67.8)	67.8 (67.8)	67.8 (67.8)	
100	61.0 (61.5)	61.0 (61.5)	61.0 (61.5)	61.0 (61.5)	61.0 (61.5)	250
150	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	
200	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	
≥250	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	
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V_{Rd} — $s_s \geq 100$ mm — Total design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 190	200	300	400	≥500	Anchor spacing [mm]
100	20.6 (24.0)	21.1 (24.7)	25.0 (29.2)	25.0 (29.2)	25.0 (29.2)	150
150	30.1 (35.1)	31.0 (36.1)	37.8 (44.2)	42.7 (49.8)	42.7 (49.8)	
200	39.7 (46.4)	40.8 (47.6)	49.8 (58.1)	57.6 (67.1)	63.0 (73.7)	
≥250	49.0 (57.3)	50.5 (58.8)	61.7 (72.0)	71.2 (83.2)	79.5 (87.3)	
100	20.8 (24.2)	21.3 (24.9)	25.1 (29.4)	25.1 (29.4)	25.1 (29.4)	200
150	30.4 (35.5)	31.2 (36.4)	38.2 (44.7)	43.0 (50.3)	43.0 (50.3)	
200	40.0 (46.6)	41.0 (47.8)	50.3 (58.6)	58.1 (67.6)	63.4 (74.2)	
≥250	49.5 (57.6)	50.8 (59.3)	62.2 (72.5)	71.7 (83.9)	80.3 (87.3)	
100	20.6 (24.0)	21.2 (24.7)	25.0 (29.3)	25.0 (29.3)	25.0 (29.3)	250
150	30.3 (35.4)	31.1 (36.4)	38.1 (44.4)	43.0 (50.0)	43.0 (50.0)	
200	39.9 (46.6)	41.0 (47.8)	50.0 (58.6)	57.8 (67.6)	63.4 (73.9)	
≥250	49.3 (57.6)	50.8 (59.0)	62.0 (72.5)	71.7 (83.7)	80.0 (87.3)	
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$F_{Rd\,45°}$ — $s_s \geq 100$ mm — Total design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 190	200	300	400	≥500	Anchor spacing [mm]
100	26.2 (31.3)	26.6 (31.9)	30.3 (36.1)	30.3 (36.1)	30.3 (36.1)	150
150	36.6 (41.8)	37.5 (42.6)	43.7 (49.4)	47.5 (53.5)	47.5 (53.5)	
200	45.7 (50.9)	46.6 (51.9)	53.5 (59.0)	58.7 (64.2)	61.9 (67.3)	
≥250	53.0 (58.5)	54.0 (59.4)	61.1 (66.6)	66.3 (71.4)	70.1 (75.2)	
100	26.3 (30.2)	26.9 (30.9)	30.6 (35.2)	30.6 (35.2)	30.6 (35.2)	200
150	36.1 (40.6)	36.9 (41.3)	42.8 (47.5)	46.3 (51.1)	46.3 (51.1)	
200	44.1 (48.8)	44.9 (49.7)	51.1 (55.9)	55.6 (60.4)	58.5 (63.2)	
≥250	50.7 (55.6)	51.4 (56.3)	57.8 (62.5)	62.1 (66.6)	65.4 (69.7)	
100	26.2 (29.4)	26.8 (30.0)	30.4 (34.3)	30.4 (34.3)	30.4 (34.3)	250
150	35.2 (39.4)	35.9 (40.0)	41.4 (45.7)	44.7 (49.2)	44.7 (49.2)	
200	42.6 (47.1)	43.4 (47.8)	49.2 (53.5)	53.2 (57.5)	55.7 (59.9)	
≥250	48.8 (53.2)	49.5 (53.8)	55.2 (59.4)	59.0 (63.0)	61.8 (65.6)	
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() values in parenthesis for uncracked concrete

N_{Rd} — Design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 190	200	300	400	≥500	Anchor spacing [mm]
100	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	150
150	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
200	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
≥250	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
100	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	200
150	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
200	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
≥250	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
100	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	250
150	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
200	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
≥250	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	40.5 (40.5)	
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V_{Rd} — Design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 190	200	300	400	≥500	Anchor spacing [mm]
100	23.6 (27.5)	24.2 (28.2)	28.6 (33.3)	28.6 (33.3)	28.6 (33.3)	150
150	35.6 (41.5)	36.6 (42.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	
200	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	
≥250	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	
100	24.0 (28.1)	24.7 (28.8)	29.2 (33.9)	29.2 (33.9)	29.2 (33.9)	200
150	36.1 (42.2)	37.1 (43.2)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	
200	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	
≥250	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	
100	24.2 (28.2)	24.8 (28.9)	29.3 (34.2)	29.3 (34.2)	29.3 (34.2)	250
150	36.4 (42.5)	37.3 (43.6)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	
200	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	
≥250	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	43.7 (43.7)	
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$F_{Rd\,45°}$ — Design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 190	200	300	400	≥500	Anchor spacing [mm]
100	28.8 (32.4)	29.4 (33.0)	33.4 (37.3)	33.4 (37.3)	33.4 (37.3)	150
150	39.1 (42.1)	39.8 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	
200	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	
≥250	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	
100	28.8 (32.5)	29.4 (33.1)	33.3 (37.2)	33.3 (37.2)	33.3 (37.2)	200
150	38.8 (42.1)	39.4 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	
200	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	
≥250	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	
100	28.7 (32.1)	29.2 (32.7)	33.0 (36.7)	33.0 (36.7)	33.0 (36.7)	250
150	38.1 (41.9)	38.8 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	
200	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	
≥250	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	42.1 (42.1)	
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() values in parenthesis for uncracked concrete

N_{Rd} — $s_s \geq 100$ mm — Total design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 190	200	300	400	≥500	Anchor spacing [mm]
100	77.1 (77.1)	77.1 (77.1)	77.1 (77.1)	77.1 (77.1)	77.1 (77.1)	150
150	77.1 (77.1)	77.1 (77.1)	77.1 (77.1)	77.1 (77.1)	77.1 (77.1)	
200	77.1 (77.1)	77.1 (77.1)	77.1 (77.1)	77.1 (77.1)	77.1 (77.1)	
≥250	77.1 (77.1)	77.1 (77.1)	77.1 (77.1)	77.1 (77.1)	77.1 (77.1)	
100	67.8 (67.8)	67.8 (67.8)	67.8 (67.8)	67.8 (67.8)	67.8 (67.8)	200
150	67.8 (67.8)	67.8 (67.8)	67.8 (67.8)	67.8 (67.8)	67.8 (67.8)	
200	67.8 (67.8)	67.8 (67.8)	67.8 (67.8)	67.8 (67.8)	67.8 (67.8)	
≥250	67.8 (67.8)	67.8 (67.8)	67.8 (67.8)	67.8 (67.8)	67.8 (67.8)	
100	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	250
150	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	
200	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	
≥250	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	61.5 (61.5)	
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-	- -	- -	- -	- -	- -	

V_{Rd} — $s_s \geq 100$ mm — Total design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 190	200	300	400	≥500	Anchor spacing [mm]
100	26.2 (30.6)	27.0 (31.5)	31.9 (37.2)	31.9 (37.2)	31.9 (37.2)	150
150	38.3 (44.9)	39.4 (45.9)	48.3 (56.4)	54.4 (63.4)	54.4 (63.4)	
200	50.5 (59.0)	51.7 (60.5)	63.4 (74.2)	73.2 (85.4)	80.3 (87.3)	
≥250	62.5 (73.0)	64.2 (74.9)	78.6 (87.3)	87.3 (87.3)	87.3 (87.3)	
100	26.5 (30.9)	27.1 (31.6)	32.1 (37.5)	32.1 (37.5)	32.1 (37.5)	200
150	38.8 (45.1)	39.8 (46.4)	48.6 (56.9)	54.7 (63.9)	54.7 (63.9)	
200	51.0 (59.3)	52.2 (61.0)	63.9 (74.7)	73.7 (86.1)	81.0 (87.3)	
≥250	63.0 (73.4)	64.7 (75.4)	79.0 (87.3)	87.3 (87.3)	87.3 (87.3)	
100	26.2 (30.8)	27.0 (31.5)	32.0 (37.2)	32.0 (37.2)	32.0 (37.2)	250
150	38.6 (45.1)	39.5 (46.1)	48.6 (56.6)	54.7 (63.7)	54.7 (63.7)	
200	50.8 (59.3)	52.2 (60.8)	63.9 (74.7)	73.7 (85.9)	80.8 (87.3)	
≥250	63.0 (73.4)	64.4 (75.1)	79.0 (87.3)	87.3 (87.3)	87.3 (87.3)	
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$F_{Rd\,45°}$ — $s_s \geq 100$ mm — Total design resistance [kN]

Edge distance $c_{1,1}$ [mm]	Member thickness h [mm] 190	200	300	400	≥500	Anchor spacing [mm]
100	33.3 (37.5)	34.0 (38.3)	38.7 (43.7)	38.7 (43.7)	38.7 (43.7)	150
150	44.7 (49.9)	45.6 (50.7)	52.5 (58.0)	56.6 (62.1)	56.6 (62.1)	
200	54.0 (59.5)	54.9 (60.4)	62.1 (67.6)	67.3 (72.5)	70.4 (75.6)	
≥250	61.6 (67.1)	62.5 (68.0)	69.7 (74.9)	74.5 (79.4)	78.0 (82.5)	
100	32.4 (36.5)	33.0 (37.3)	37.6 (42.1)	37.6 (42.1)	37.6 (42.1)	200
150	43.2 (47.8)	43.9 (48.7)	50.2 (55.1)	53.8 (58.7)	53.8 (58.7)	
200	51.6 (56.4)	52.3 (57.1)	58.7 (63.3)	63.0 (67.3)	65.6 (69.9)	
≥250	58.2 (62.8)	59.0 (63.7)	65.1 (69.4)	69.0 (73.0)	72.0 (75.6)	
100	31.6 (35.6)	32.2 (36.3)	36.6 (40.7)	36.6 (40.7)	36.6 (40.7)	250
150	41.8 (46.1)	42.5 (46.9)	48.3 (52.6)	51.6 (55.9)	51.6 (55.9)	
200	49.5 (53.8)	50.2 (54.5)	55.9 (60.1)	59.7 (63.5)	62.1 (65.7)	
≥250	55.6 (59.7)	56.3 (60.2)	61.4 (65.2)	65.1 (68.3)	67.5 (70.7)	
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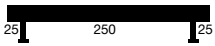
() values in parenthesis for uncracked concrete

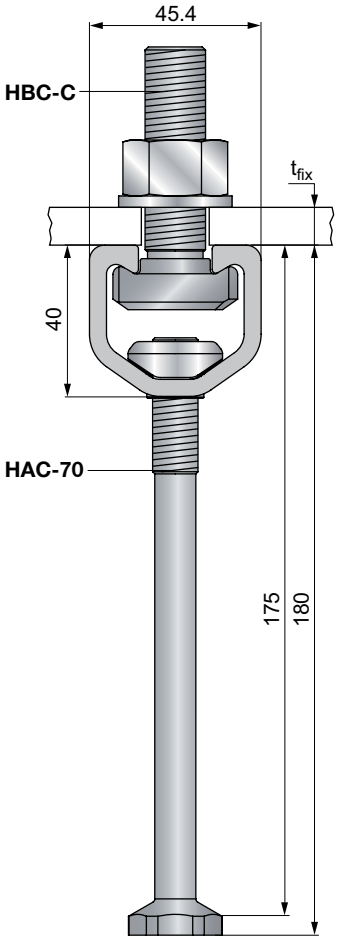
Channel length [mm]	Anchor spacing [mm]	Number of anchors [pcs]	
300	250	2	
350	150	3	
450	200	3	
550	250	3	
1050	250	5	
1550	250	7	
2050	250	9	
2300	250	10	
5800	250	24	
Other anchor channel lengths on request.			

Minimum requirements

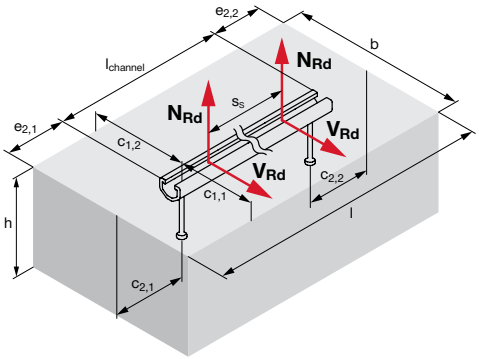
Dimensions	[mm]
$c_{1,i}$	100
h	180 + c
b	200
l	150 + $l_{channel}$
c = concrete cover according to DIN EN 1992-1-1:2005	

Edge distance $c_{1,1}$ [mm] $c_{1,2} \geq c_{1,1}$	Minimum corner distance min $c_{2,1}$; min $c_{2,2}$ [mm]
100	269
150	346
200	446
250	546

	Bolt length [mm]	Clamping length t_{fix} [mm]
M10	30	8
	40	18
	50	28
	60	38
	70	48
	80	58
	100	78
M12	30	5
	40	15
	50	25
	60	35
	80	55
	100	75
	125	100
	150	125
M16	30	1
	40	10
	50	20
	60	30
	65	35
	70	40
	80	50
	100	70
	125	95
	150	120
	200	170
	290	260
M20	50	15
	60	25
	80	45
	100	65
	125	90
	150	115



HBC-C [kN]				
		$N_{Rd.s}$	$V_{Rd.s}$	$F_{Rd.s.45°}$
M10	4.6	11.60	8.32	10.09
	A4-50	10.14	7.31	8.87
M12	4.6	16.85	12.10	14.70
	A4-50	14.74	10.63	12.89
M16	4.6	31.34	22.51	27.36
	8.8	83.57	50.16	66.24
	A4-50	27.42	19.75	23.89
M20	4.6	49.00	35.21	42.66
	8.8	130.67	78.32	103.48
	A4-50	42.83	30.84	37.32



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Hilti supports and advises you in all technical matters.

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Global logistics to keep your jobsite running.

Our global logistics network is the key to having Hilti anchor channels and bolts on the site when they're needed. We aim to keep your jobsite running, even in the event of unplanned specification changes, by maintaining product availability through a multi-location storage system consisting of local, regional and global stocks. We also help you avoid costly express delivery and air freight charges.

In addition to our standard range, Hilti anchor channels are available in various other lengths on request. Please contact your local Hilti organization or agent for further information.

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