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Company:	Resene Construction Systems	Page:	1
Address:		Specifier:	Mark Flewellen
Phone I Fax:	|	E-Mail:	mark@reseneconstruction.co.nz
Design:	Resene - Standard design	Date:	8/09/2022
Fastening point:			

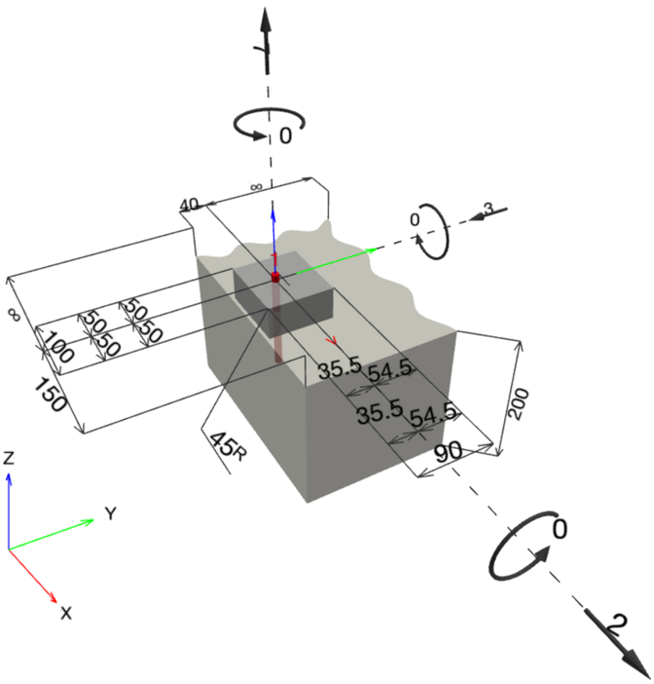
Specifier's comments: Suman.Narayan@Hilti.com

1 Input data

Anchor type and diameter:	**HUS4-H Bonded Screw 10**
Return period (service life in years):	50
Item number:	2293558 HUS4-H 10x130 75/55/45 (element) / 2294729 HUS4-MAX 10 (capsule)
Effective embedment depth:	h_{ef} = 85.0 mm, h_{nom} = 85.0 mm
Material:	1.5525
Evaluation Service Report:	ETA-18/1160
Issued I Valid:	27/07/2022 | -
Proof:	Design Method New Zealand NZS 3101, chapter 17.5.5 – ETAG Design; EOTA TR 075
Stand-off installation:	e_b = 0.0 mm (no stand-off); t = 45.0 mm
Anchor plate[R] :	l_x x l_y x t = 100.0 mm x 90.0 mm x 45.0 mm; (Recommended plate thickness: not calculated)
Profile:	no profile
Base material:	uncracked concrete, C25/30, $f_{c,cube}$ = 30.00 N/mm^2; h = 200.0 mm, Temp. short/long: 40/24 °C
Installation:	**hammer drilled hole, Installation condition: Dry**
Reinforcement:	no reinforcement or reinforcement spacing >= 150 mm (any Ø) or >= 100 mm (Ø <= 10 mm)
	no longitudinal edge reinforcement
	Reinforcement to control splitting according to ETAG 001, Annex C, 5.2.2.6 present.

[R] - The anchor calculation is based on a rigid anchor plate assumption.

Geometry [mm] & Loading [kN, kNm]



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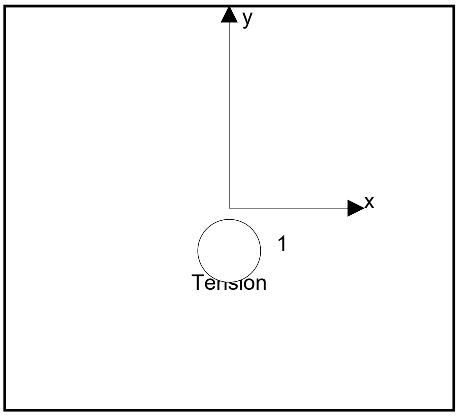
1.1 Load combination

Case	Description	Forces [kN] / Moments [kNm]	Seismic	Fire	Max. Util. Anchor [%]
1	Combination 1	$N = 7.000$; $V_x = 2.000$; $V_y = -3.000$; $M_x = 0.000$; $M_y = 0.000$; $M_z = 0.000$;	no	no	96

2 Load case/Resulting anchor forces



Anchor reactions [kN]

Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	7.000	3.606	2.000	-3.000

max. concrete compressive strain:	- [‰]
max. concrete compressive stress:	- [N/mm^2]
resulting tension force in (x/y)=(0.0/-9.5):	7.000 [kN]
resulting compression force in (x/y)=(0.0/0.0):	0.000 [kN]

Anchor forces are calculated based on the assumption of a rigid anchor plate.

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3 Tension load (ETAG, Annex C, Section 5.2.2)

	Load [kN]	Capacity [kN]	Utilization β_N [%]	Status
Steel Strength*	7.000	36.667	20	OK
Combined pullout-concrete cone failure**	7.000	14.129	50	OK
Concrete Breakout Failure**	7.000	15.076	47	OK
Splitting failure**	7.000	17.524	40	OK

* highest loaded anchor **anchor group (anchors in tension)

3.1 Steel Strength

$$N_{Sd} \leq N_{Rd,s} = \frac{N_{Rk,s}}{\gamma_{M,s}}$$ ETAG 001 Annex C, Table 5.2.2.1

$N_{Rk,s}$ [kN]	$\gamma_{M,s}$	$N_{Rd,s}$ [kN]	N_{Sd} [kN]
55.000	1.500	36.667	7.000

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3.2 Combined pullout-concrete cone failure

$N_{Sd} \leq N_{Rd,p} = \frac{N_{Rk,p}}{\gamma_{M,p}}$ EOTA TR 029, Table 5.2.2.1

$N_{Rk,p} = N^0_{Rk,p} \cdot \frac{A_{p,N}}{A^0_{p,N}} \cdot \psi_{g,Np} \cdot \psi_{s,Np} \cdot \psi_{re,N} \cdot \psi_{ec1,Np} \cdot \psi_{ec2,Np}$ EOTA TR 075, Eq. (1)

$N^0_{Rk,p} = \psi_{sus} \cdot N'_{Rk,p}$ EOTA TR 075, Eq. (2)

$\psi_{sus} = 1$ EN 1992-4, Eq.(7.14a)

$A^0_{p,N} = s_{cr,Np} \cdot s_{cr,Np}$

$s_{cr,Np} = 4.1 \cdot \left(\psi_{sus} \cdot \frac{d}{h_{ef}} \cdot N_{Rk,p,ucr,C20/25}\right)^{0.5} \leq 3 \cdot h_{ef}$ EOTA TR 075, Eq. (3)

$c_{cr,Np} = \frac{s_{cr,Np}}{2}$

$\psi_{g,Np} = \psi^0_{g,Np} - \left(\frac{s}{s_{cr,Np}}\right)^{0.5} \cdot (\psi^0_{g,Np} - 1) \geq 1.00$ EOTA TR 075, Eq. (4)

$\psi^0_{g,Np} = \sqrt{n} - (\sqrt{n} - 1) \cdot \left(\frac{N'_{Rk,p}}{N_{Rk,c}}\right)^{1.5} \geq 1.00$ EOTA TR 075, Eq. (5)

$N_{Rk,c} = k_3 \cdot h_{ef}^{1.5} \cdot \sqrt{f_{ck}}$ EOTA TR 075, Eq. (6)

$\psi_{s,Np} = 0.7 + 0.3 \cdot \frac{c}{c_{cr,Np}} \leq 1.00$ EN 1992-4, Eq.(7.20)

$\psi_{ec1,Np} = \frac{1}{1 + \frac{2 \cdot e_{1,N}}{s_{cr,Np}}} \leq 1.00$ EN 1992-4, Eq.(7.21)

$\psi_{ec2,Np} = \frac{1}{1 + \frac{2 \cdot e_{2,N}}{s_{cr,Np}}} \leq 1.00$ EN 1992-4, Eq.(7.21)

d [mm]	h_{ef} [mm]	$N_{Rk,p,ucr,C20/25}$ [kN]	$s_{cr,Np}$ [mm]	$c_{cr,Np}$ [mm]	$N'_{Rk,p}$ [kN]	ψ_{sus}
10.0	85.0	38.000	255.0	127.5	40.631	1.000

$N^0_{Rk,p}$ [kN]	$A^0_{p,N}$ [mm²]	$A_{p,N}$ [mm²]	k_3	f_{ck} [N/mm²]	$N_{Rk,c}$ [kN]	n
40.631	65,025	42,712	11.00	25.00	0.000	1

$\psi^0_{g,Np}$	s [mm]	$\psi_{g,Np}$	c_{min} [mm]	$\psi_{s,Np}$	$\psi_{re,Np}$	$e_{1,N}$ [mm]
1.000	-	1.000	40.0	0.794	1.000	0.0

$\psi_{ec1,Np}$	$e_{2,N}$ [mm]	$\psi_{ec2,Np}$	$N_{Rk,p}$ [kN]	γ_{Mp}	$N_{Rd,p}$ [kN]	N_{Sd} [kN]
1.000	0.0	1.000	21.194	1.500	14.129	7.000

Group anchor ID
1

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3.3 Concrete Breakout Failure

$N_{Sd} \le N_{Rd,c} = \frac{N_{Rk,c}}{\gamma_{M,c}}$	ETAG 001 Annex C, Table 5.2.2.1
$N_{Rk,c} = N^0_{Rk,c} \cdot \frac{A_{c,N}}{A^0_{c,N}} \cdot \psi_{s,N} \cdot \psi_{re,N} \cdot \psi_{ec1,N} \cdot \psi_{ec2,N}$	ETAG 001 Annex C, Eq. (5.2)
$N^0_{Rk,c} = k_1 \cdot \sqrt{f_{ck,cube}} \cdot h_{ef}^{1,5}$	ETAG 001 Annex C, Eq. (5.2a)
$A^0_{c,N} = s_{cr,N} \cdot s_{cr,N}$	ETAG 001 Annex C, Eq. (5.2b)
$\psi_{s,N} = 0.7 + 0.3 \cdot \frac{c}{c_{cr,N}} \le 1.00$	ETAG 001 Annex C, Eq. (5.2c)
$\psi_{re,N} = 0.5 + \frac{h_{ef}}{200} \le 1.00$	ETAG 001 Annex C, Eq. (5.2d)
$\psi_{ec1,N} = \frac{1}{1 + \frac{2 \cdot e_{c1,N}}{s_{cr,N}}} \le 1.00$	ETAG 001 Annex C, Eq. (5.2e)
$\psi_{ec2,N} = \frac{1}{1 + \frac{2 \cdot e_{c2,N}}{s_{cr,N}}} \le 1.00$	ETAG 001 Annex C, Eq. (5.2e)

$A_{c,N}$ [mm^2]	$A^0_{c,N}$ [mm^2]	$c_{cr,N}$ [mm]	$s_{cr,N}$ [mm]
42,712	65,025	127.5	255.0

$e_{c1,N}$ [mm]	$\psi_{ec1,N}$	$e_{c2,N}$ [mm]	$\psi_{ec2,N}$	$\psi_{s,N}$	$\psi_{re,N}$
0.0	1.000	0.0	1.000	0.794	1.000

k_1	$N^0_{Rk,c}$ [kN]	$\gamma_{M,c}$	$N_{Rd,c}$ [kN]	N_{Sd} [kN]
10.100	43.352	1.500	15.076	7.000

Group anchor ID
1

3.4 Splitting failure

$N_{Sd} \leq N_{Rd,sp} = \frac{N_{Rk,sp}}{\gamma_{M,sp}}$ — ETAG 001 Annex C, Table 5.2.2.1

$N_{Rk,sp} = N^0_{Rk,c} \cdot \frac{A_{c,N}}{A^0_{c,N}} \cdot \psi_{s,N} \cdot \psi_{re,N} \cdot \psi_{ec1,N} \cdot \psi_{ec2,N} \cdot \psi_{h,sp}$ — ETAG 001 Annex C, Eq. (5.3)

$N^0_{Rk,c} = k_1 \cdot \sqrt{f_{ck,cube}} \cdot h_{ef}^{1,5}$ — ETAG 001 Annex C, Eq. (5.2a)

$A^0_{c,N} = s_{cr,sp} \cdot s_{cr,sp}$ — ETAG 001 Annex C, Eq. (5.2b)

$\psi_{s,N} = 0.7 + 0.3 \cdot \frac{c}{c_{cr,sp}} \leq 1.00$ — ETAG 001 Annex C, Eq. (5.2c)

$\psi_{ec1,N} = \frac{1}{1 + \left(\frac{2 \cdot e_{c1,N}}{s_{cr,sp}}\right)} \leq 1.00$ — ETAG 001 Annex C, Eq. (5.2e)

$\psi_{ec2,N} = \frac{1}{1 + \left(\frac{2 \cdot e_{c2,N}}{s_{cr,sp}}\right)} \leq 1.00$ — ETAG 001 Annex C, Eq. (5.2e)

$\psi_{h,sp} = \left(\frac{h}{h_{min}}\right)^{2/3} \leq 1.5$ — ETAG 001 Annex C, Eq. (5.3a)

$A_{c,N}$ [mm²]	$A^0_{c,N}$ [mm²]	$c_{cr,sp}$ [mm]	$s_{cr,sp}$ [mm]	$\psi_{h,sp}$
47,872	73,984	136.0	272.0	1.268

$e_{c1,N}$ [mm]	$\psi_{ec1,N}$	$e_{c2,N}$ [mm]	$\psi_{ec2,N}$	$\psi_{s,N}$	$\psi_{re,N}$	k_1
0.0	1.000	0.0	1.000	0.788	1.000	10.100

$N^0_{Rk,c}$ [kN]	$\gamma_{M,sp}$	$N_{Rd,sp}$ [kN]	N_{Sd} [kN]
40.631	1.500	17.524	7.000

Group anchor ID
1

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4 Shear load (ETAG, Annex C, Section 5.2.3)

	Load [kN]	Capacity [kN]	Utilization β_V [%]	Status
Steel Strength (without lever arm)*	3.606	25.600	15	OK
Steel failure (with lever arm)*	N/A	N/A	N/A	N/A
Pryout Strength**	3.606	27.915	13	OK
Concrete edge failure in direction y-**	3.606	5.043	72	OK

* highest loaded anchor **anchor group (relevant anchors)

4.1 Steel Strength (without lever arm)

$V_{Sd} \leq V_{Rd,s} = \frac{V_{Rk,s}}{\gamma_{M,s}}$ ETAG 001 Annex C, Table 5.2.3.1

$V_{Rk,s}$ [kN]	$\gamma_{M,s}$	$V_{Rd,s}$ [kN]	V_{Sd} [kN]
32.000	1.250	25.600	3.606

4.2 Pryout Strength (Bond Strength controls)

$V_{Sd} \leq V_{Rd,cp} = \frac{V_{Rk,cp}}{\gamma_{Mc,p}}$ EOTA TR 029, Table 5.2.3.1

$V^0_{Rk,cp} = k_{cp} \cdot \min\{N_{Rk,c}; N_{Rk,p}\}$

$N_{Rk,p} = N^0_{Rk,p} \cdot \frac{A_{p,N}}{A^0_{p,N}} \cdot \psi_{g,Np} \cdot \psi_{s,Np} \cdot \psi_{re,N} \cdot \psi_{ec1,Np} \cdot \psi_{ec2,Np}$ EOTA TR 075, Eq. (1)

$N^0_{Rk,p} = \psi_{sus} \cdot N'_{Rk,p}$ EOTA TR 075, Eq. (2)

$A^0_{p,N} = s_{cr,Np} \cdot s_{cr,Np}$

$\psi_{sus} = 1$ EN 1992-4, Eq. (7.14a)

$s_{cr,Np} = 4.1 \cdot \left(\psi_{sus} \cdot \frac{d}{h_{ef}} \cdot N_{Rk,p,ucr,C20/25}\right)^{0.5} \leq 3 \cdot h_{ef}$ EOTA TR 075, Eq. (3)

$c_{cr,Np} = \frac{s_{cr,Np}}{2}$

$\psi_{g,Np} = \psi^0_{g,Np} - \left(\frac{s}{s_{cr,Np}}\right)^{0.5} \cdot \left(\psi^0_{g,Np} - 1\right) \geq 1.00$ EOTA TR 075, Eq. (4)

$\psi^0_{g,Np} = \sqrt{n} - (\sqrt{n} - 1) \cdot \left(\frac{N'_{Rk,p}}{N_{Rk,c}}\right)^{1.5} \geq 1.00$ EOTA TR 075, Eq. (5)

$N_{Rk,c} = k_3 \cdot h_{ef}^{1.5} \cdot \sqrt{f_{ck}}$ EOTA TR 075, Eq. (6)

$\psi_{s,Np} = 0.7 + 0.3 \cdot \frac{c}{c_{cr,Np}} \leq 1.00$ EN 1992-4, Eq.(7.20)

$\psi_{re,Np} = 0.5 + \frac{h_{ef}}{200} \leq 1.00$ EN 1992-4, Table 7.5

$\psi_{ec1,Np} = \frac{1}{1 + \frac{2 \cdot e_{1,V}}{s_{cr,Np}}} \leq 1.00$ EN 1992-4, Eq.(7.21)

$\psi_{ec2,Np} = \frac{1}{1 + \frac{2 \cdot e_{2,V}}{s_{cr,Np}}} \leq 1.00$ EN 1992-4, Eq.(7.21)

d [mm]	h_{ef} [mm]	$N_{Rk,p,ucr,C20/25}$ [kN]	$c_{cr,Np}$ [mm]	$s_{cr,Np}$ [mm]	$N'_{Rk,p}$ [kN]	ψ_{sus}
10.0	85.0	38.000	127.5	255.0	40.136	1.000

$N^0_{Rk,p}$ [kN]	$A^0_{p,N}$ [mm^2]	$A_{p,N}$ [mm^2]	k_3	f_{ck} [N/mm^2]	k_{cp}	$N_{Rk,c}$ [kN]
40.136	65,025	42,712	11.000	25.00	2.0	0.000

n	$\psi^0_{g,Np}$	s [mm]	$\psi_{g,Np}$	c_{min} [mm]	$\psi_{s,Np}$	$\psi_{re,Np}$
1	1.000	-	1.000	40.0	0.794	1.000

$e_{1,V}$ [mm]	$\psi_{ec1,Np}$	$e_{2,V}$ [mm]	$\psi_{ec2,Np}$
0.0	1.000	0.0	1.000

$V_{Rk,cp}$ [kN]	$\gamma_{Mc,p}$	$V_{Rd,cp}$ [kN]	V_{Sd} [kN]
41.872	1.500	27.915	3.606

Group anchor ID
1

4.3 Concrete edge failure in direction y-

$V_{Sd} \le V_{Rd,c} = \frac{V_{Rk,c}}{\gamma_{M,c}}$	ETAG 001 Annex C, Table 5.2.3.1
$V_{Rk,c} = V^0_{Rk,c} \cdot \frac{A_{c,V}}{A^0_{c,V}} \cdot \psi_{s,V} \cdot \psi_{h,V} \cdot \psi_{\alpha,V} \cdot \psi_{ec,V} \cdot \psi_{re,V}$	ETAG 001 Annex C, Eq. (5.7)
$V^0_{Rk,c} = k_1 \cdot d^{\alpha}_{nom} \cdot l^{\beta}_f \cdot \sqrt{f_{ck,cube}} \cdot c_1^{1,5}$	ETAG 001 Annex C, Eq. (5.7a)
$\alpha = 0.1 \cdot \left(\frac{l_f}{c_1}\right)^{0,5}$	ETAG 001 Annex C, Eq. (5.7b)
$\beta = 0.1 \cdot \left(\frac{d_{nom}}{c_1}\right)^{0,2}$	ETAG 001 Annex C, Eq. (5.7c)
$A^0_{c,V} = 4.5 \cdot c_1^2$	ETAG 001 Annex C, Eq. (5.7d)
$\psi_{s,V} = 0.7 + 0.3 \cdot \frac{c_2}{1.5 \cdot c_1} \le 1.00$	ETAG 001 Annex C, Eq. (5.7e)
$\psi_{h,V} = \left(\frac{1.5 \cdot c_1}{h}\right)^{0,5} \ge 1.00$	ETAG 001 Annex C, Eq. (5.7f)
$\psi_{\alpha,V} = \sqrt{\frac{1}{(\cos \alpha_V)^2 + \left(\frac{\sin \alpha_V}{2.5}\right)^2}} \ge 1.00$	ETAG 001 Annex C, Eq. (5.7g)
$\psi_{ec,V} = \frac{1}{1 + \frac{2 \cdot e_{c,V}}{3 \cdot c_1}} \le 1.00$	ETAG 001 Annex C, Eq. (5.7h)

l_f [mm]	d_{nom} [mm]	k_1	α	β
85.0	10.00	2.400	0.146	0.076

c_1 [mm]	$A_{c,V}$ [mm^2]	$A^0_{c,V}$ [mm^2]
40.0	7,200	7,200

$\psi_{s,V}$	$\psi_{h,V}$	$\psi_{\alpha,V}$	$e_{c,V}$ [mm]	$\psi_{ec,V}$	$\psi_{re,V}$
1.000	1.000	1.161	0.0	1.000	1.000

$V^0_{Rk,c}$ [kN]	$\gamma_{M,c}$	$V_{Rd,c}$ [kN]	V_{Sd} [kN]
6.514	1.500	5.043	3.606

5 Combined tension and shear loads (ETAG, Annex C, Section 5.2.4)

Steel failure

β_N	β_V	α	Utilization $\beta_{N,V}$ [%]	Status
0.495	0.715	1.500	96	OK

$\beta_N^{\alpha} + \beta_V^{\alpha} \leq 1.0$

6 Displacements (highest loaded anchor)

Short term loading:

N_{Sk}	=	5.185 [kN]	δ_N	=	0.0910 [mm]
V_{Sk}	=	2.671 [kN]	δ_V	=	0.1459 [mm]
			δ_{NV}	=	0.1720 [mm]

Long term loading:

N_{Sk}	=	5.185 [kN]	δ_N	=	0.1819 [mm]
V_{Sk}	=	2.671 [kN]	δ_V	=	0.2189 [mm]
			δ_{NV}	=	0.2846 [mm]

Comments: Tension displacements are valid with half of the required installation torque moment for uncracked concrete! Shear displacements are valid without friction between the concrete and the anchor plate! The gap due to the drilled hole and clearance hole tolerances are not included in this calculation!

The acceptable anchor displacements depend on the fastened construction and must be defined by the designer!

7 Warnings

- The anchor design methods in PROFIS Engineering require rigid anchor plates per current regulations (AS 5216:2021, ETAG 001/Annex C, EOTA TR029 etc.). This means load re-distribution on the anchors due to elastic deformations of the anchor plate are not considered - the anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Engineering calculates the minimum required anchor plate thickness with CBFEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid anchor plate assumption is valid is not carried out by PROFIS Engineering. Input data and results must be checked for agreement with the existing conditions and for plausibility!
- In general, the conditions given in ETAG 001, Annex C, section 4.2.2.1 and 4.2.2.3 b) are not fulfilled because the diameter of the clearance hole in the fixture acc. to Annex 3, Table 3 is greater than the values given in Annex C, Table 4.1 and AS5126 for the corresponding diameter of the anchor. Therefore the design resistance for anchor groups is limited to twice the steel resistance (of a single anchor) in accordance with the approval.
- Checking the transfer of loads into the base material is required in accordance with ETAG 001, Annex C(2010)Section 7! The software considers that the grout is installed under the anchor plate without creating air voids and before application of the loads.
- The design is only valid if the clearance hole in the fixture is not larger than the value given in Table 4.1 of ETAG 001, Annex C! For larger diameters of the clearance hole see Chapter 1.1. of ETAG 001, Annex C!
- The accessory list in this report is for the information of the user only. In any case, the instructions for use provided with the product have to be followed to ensure a proper installation.
- The characteristic bond resistances depend on the return period (service life in years): 50

Fastening meets the design criteria!

8 Installation data

Anchor plate, steel: S 235; E = 210,000.00 N/mm^2; f_{yk} = 235.00 N/mm^2

Profile: no profile

Hole diameter in the fixture: d_f = 14.0 mm

Plate thickness (input): 45.0 mm

Recommended plate thickness: not calculated

Drilling method: Hammer drilled

Cleaning: Clean the drill hole. Under the conditions - according to fastener size and drilling direction - given in the ETA and MPII (IFU), the cleaning of the drill hole may be omitted.

Anchor type and diameter: HUS4-H Bonded Screw 10

Item number: 2293558 HUS4-H 10x130 75/55/45 (element) / 2294729 HUS4-MAX 10 (capsule)

Maximum installation torque: 20 Nm

Hole diameter in the base material: 10.0 mm

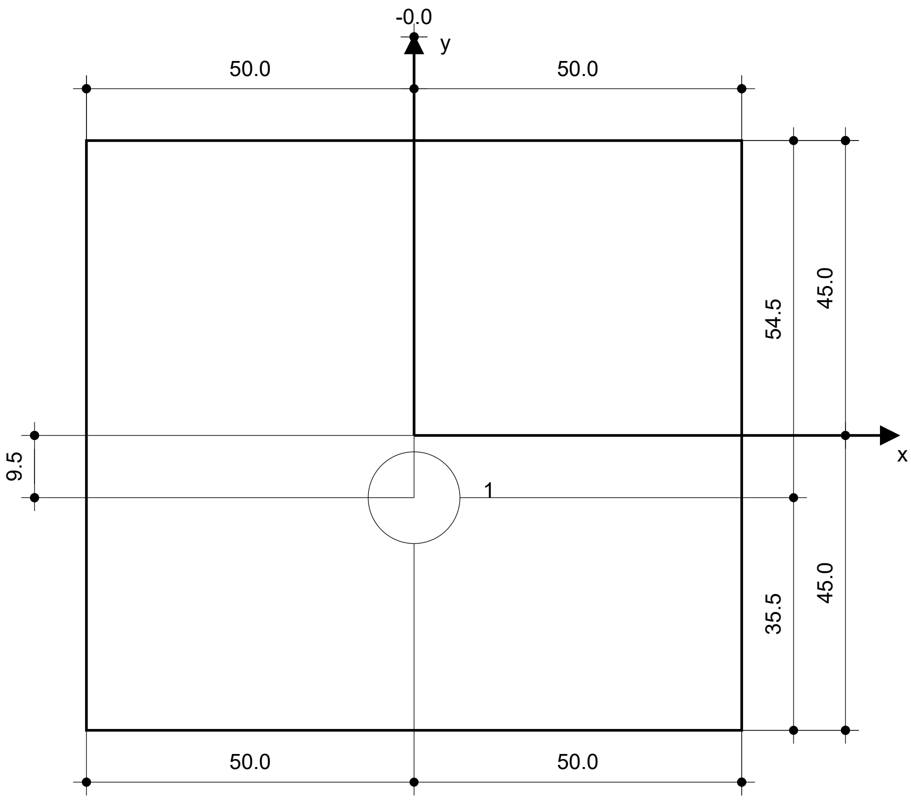
Hole depth in the base material: 95.0 mm

Minimum thickness of the base material: 140.0 mm

Hilti HUS screw anchor with MAX capsule mortar with 85 mm embedment h_ef, 10, Steel galvanized, Hammer drilled installation per ETA-18/1160

8.1 Recommended accessories

Drilling	Cleaning	Setting
• Suitable Rotary Hammer • Properly sized drill bit	• Manual blow-out pump	• Hilti SIW 22T-A impact screw driver



Coordinates Anchor [mm]

Anchor	x	y	c_{-x}	c_{+x}	c_{-y}	c_{+y}
1	0.0	-9.5	-	150.0	40.0	-

9 Remarks; Your Cooperation Duties

- Any and all information and data contained in the Software concern solely the use of Hilti products and are based on the principles, formulas and security regulations in accordance with Hilti's technical directions and operating, mounting and assembly instructions, etc., that must be strictly complied with by the user. All figures contained therein are average figures, and therefore use-specific tests are to be conducted prior to using the relevant Hilti product. The results of the calculations carried out by means of the Software are based essentially on the data you put in. Therefore, you bear the sole responsibility for the absence of errors, the completeness and the relevance of the data to be put in by you. Moreover, you bear sole responsibility for having the results of the calculation checked and cleared by an expert, particularly with regard to compliance with applicable norms and permits, prior to using them for your specific facility. The Software serves only as an aid to interpret norms and permits without any guarantee as to the absence of errors, the correctness and the relevance of the results or suitability for a specific application.
- You must take all necessary and reasonable steps to prevent or limit damage caused by the Software. In particular, you must arrange for the regular backup of programs and data and, if applicable, carry out the updates of the Software offered by Hilti on a regular basis. If you do not use the AutoUpdate function of the Software, you must ensure that you are using the current and thus up-to-date version of the Software in each case by carrying out manual updates via the Hilti Website. Hilti will not be liable for consequences, such as the recovery of lost or damaged data or programs, arising from a culpable breach of duty by you.