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Design:	Concrete - 15 Apr 2025	Date:	15/04/2025
Fastening Point:			

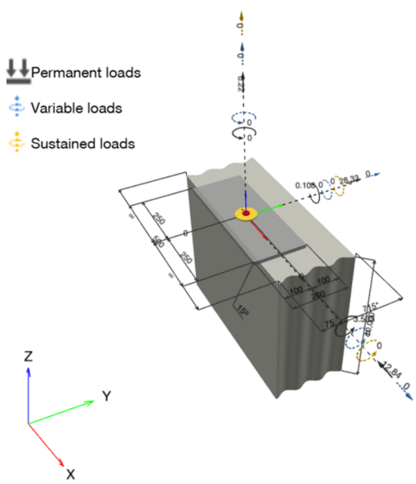
Specifier's comments:

1 Input data

Anchor type and size:	**HIT-HY 200-A V3 + HAS-U A4 M27**
Return period (service life in years):	50
Item number:	not available (insert) / 2378172 HIT-HY 200-A V3 (mortar)
Hilti Filling Set or any suitable annular gap filling solution	
Specification text:	Hilti HAS-U A4 threaded rod with HIT-HY 200-A V3 injection mortar with 380 mm embedment hef, M27, Stainless steel, Hammer drill bit installation per ETA 19/0601, with annular gaps filled with Hilti Filling Set or any suitable gap solutions,
Effective embedment depth:	$h_{ef,act}$ = 380.0 mm ($h_{ef,limit}$ = - mm)
Material:	A4
Approval No.:	ETA 19/0601
Issued I Valid:	29/01/2024 | -
Proof:	SOFA based on EN 1992-4 and fib bulletin 58, Chemical
Stand-off installation:	e_b = 0.0 mm (no stand-off); t = 15.0 mm
Baseplate^R :	l_x x l_y x t = 500.0 mm x 200.0 mm x 15.0 mm; (Recommended plate thickness: not calculated)
Profile:	no profile
Base material:	cracked concrete, C40/50, $f_{c,cyl}$ = 40.00 N/mm^2; h =10,000.0 mm, Temp. short/long: 0/0 °C, partial material safety factor γ_c = 1.500
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

^{R} - The anchor calculation is based on a rigid baseplate 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	Load case 1	$N = 0.308$; $V_x = -17.976$; $V_y = 39.662$; $M_x = 4.904$; $M_y = 0.151$; $M_z = 0.000$; $N_{sus} = 0.000$; $M_{x,sus} = 0.000$; $M_{y,sus} = 0.000$;	no	no	167
2	Load case 2	$N = 0.220$; $V_x = -12.840$; $V_y = 28.330$; $M_x = 3.503$; $M_y = 0.108$; $M_z = 0.000$; $N_{sus} = 0.000$; $M_{x,sus} = 0.000$; $M_{y,sus} = 0.000$;	no	no	85
3	Load case 3	$N = 0.308$; $V_x = -17.976$; $V_y = 39.662$; $M_x = 4.904$; $M_y = 0.151$; $M_z = 0.000$; $N_{sus} = 0.000$; $M_{x,sus} = 0.000$; $M_{y,sus} = 0.000$;	no	no	167

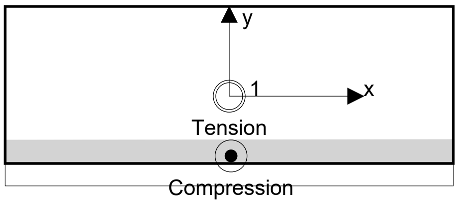
2 Load case/Resulting anchor forces

Controlling load case: 3 Load case 3

Anchor reactions [kN]

Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	73.959	43.546	-17.976	39.662



Max. concrete compressive strain: 0.39 [‰]
Max. concrete compressive stress: 11.82 [N/mm^2]
Resulting tension force in (x/y)=(0.0/0.0): 73.959 [kN]
Resulting compression force in (x/y)=(2.1/-66.6): 73.651 [kN]

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

3 Tension load (EN 1992-4, Section 7.2.1)

	Load [kN]	Capacity [kN]	Utilization β_N [%]	Status
Steel failure*	73.959	80.245	93	OK
Combined pullout-concrete cone failure**	73.959	97.257	77	OK
Concrete Breakout failure**	73.959	100.620	74	OK
Splitting failure**	73.959	107.208	69	OK

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

3.1 Steel failure

$$N_{Ed} \leq N_{Rd,s} = \frac{N_{Rk,s}}{\gamma_{Ms}}$$ EN 1992-4, Table 7.1

$N_{Rk,s}$ [kN]	γ_{Ms}	$N_{Rd,s}$ [kN]	N_{Ed} [kN]
229.500	2.860	80.245	73.959

3.2 Combined pullout-concrete cone failure

$N_{Ed} \leq N_{Rd,p} = \frac{N_{Rk,p}}{\gamma_{Mp}}$	EN 1992-4, Table 7.1
$N_{Rk,p} = N^0_{Rk,p} \cdot \frac{A_{p,N}}{A^0_{p,N}} \cdot \psi_{g,Np} \cdot \psi_{s,Np} \cdot \psi_{re,Np} \cdot \psi_{ec1,Np} \cdot \psi_{ec2,Np}$	EN 1992-4, Eq. (7.13)
$N^0_{Rk,p} = \psi_{sus} \cdot \tau_{Rk} \cdot \pi \cdot d \cdot h_{ef}$	EN 1992-4, Eq. (7.14)
$\psi_{sus} = 1$	EN 1992-4, Eq. (7.14a)
$s_{cr,Np} = 7.3 \cdot d \cdot \sqrt{\psi_{sus} \cdot \tau_{Rk}} \leq 3 \cdot h_{ef}$	EN 1992-4, Eq. (7.15)
$\psi_{g,Np} = \psi^0_{g,Np} - \left(\frac{s}{s_{cr,Np}}\right)^{0,5} \cdot \left(\psi^0_{g,Np} - 1\right) \geq 1.00$	EN 1992-4, Eq. (7.17)
$\psi^0_{g,Np} = \sqrt{n} - (\sqrt{n} - 1) \cdot \left(\frac{\tau_{Rk}}{\tau_{Rk,c}}\right)^{1,5} \geq 1.00$	EN 1992-4, Eq. (7.18)
$\tau_{Rk,c} = \frac{k_3}{\pi \cdot d} \cdot \sqrt{h_{ef} \cdot f_{ck}}$	EN 1992-4, Eq. (7.19)
$\psi_{s,Np} = 0.7 + 0.3 \cdot \frac{c}{c_{cr,Np}} \leq 1.00$	EN 1992-4, Eq. (7.20)
$\psi_{ec1,Np} = \frac{1}{1 + \left(\frac{2 \cdot e_{c1,N}}{s_{cr,Np}}\right)} \leq 1.00$	EN 1992-4, Eq. (7.21)
$\psi_{ec2,Np} = \frac{1}{1 + \left(\frac{2 \cdot e_{c2,N}}{s_{cr,Np}}\right)} \leq 1.00$	EN 1992-4, Eq. (7.21)

$A_{p,N}$ [mm^2]	$A^0_{p,N}$ [mm^2]	$\tau_{Rk,ucr,20}$ [N/mm^2]	$s_{cr,Np}$ [mm]	$c_{cr,Np}$ [mm]	c_{min} [mm]	$f_{c,cyl}$ [N/mm^2]
412,353	699,271	18.00	836.2	418.1	75.0	40.00

ψ_c	$\tau_{Rk,cr}$ [N/mm^2]	k_3	$\tau_{Rk,c}$ [N/mm^2]	$\psi^0_{g,Np}$	$\psi_{g,Np}$
1.072	10.18	7.700	11.19	1.000	1.000

$e_{c1,N}$ [mm]	$\psi_{ec1,Np}$	$e_{c2,N}$ [mm]	$\psi_{ec2,Np}$	$\psi_{s,Np}$	$\psi_{re,Np}$
0.0	1.000	0.0	1.000	0.754	1.000

ψ^0_{sus}	α_{sus}	ψ_{sus}
0.800	0.000	1.000

$N^0_{Rk,p}$ [kN]	$N_{Rk,p}$ [kN]	γ_{Mp}	$N_{Rd,p}$ [kN]	N_{Ed} [kN]
328.189	145.885	1.500	97.257	73.959

Group anchor ID
1

3.3 Concrete Breakout failure

$N_{Ed} \leq N_{Rd,c} = \frac{N_{Rk,c}}{\gamma_{Mc}}$	EN 1992-4, Table 7.1
$N_{Rk,c} = N^0_{Rk,c} \cdot \frac{A_{c,N}}{A^0_{c,N}} \cdot \psi_{s,N} \cdot \psi_{re,N} \cdot \psi_{ec1,N} \cdot \psi_{ec2,N} \cdot \psi_{M,N}$	EN 1992-4, Eq. (7.1)
$N^0_{Rk,c} = k_1 \cdot \sqrt{f_{ck}} \cdot h_{ef}^{1,5}$	EN 1992-4, Eq. (7.2)
$A^0_{c,N} = s_{cr,N} \cdot s_{cr,N}$	EN 1992-4, Eq. (7.3)
$\psi_{s,N} = 0.7 + 0.3 \cdot \frac{c}{c_{cr,N}} \leq 1.00$	EN 1992-4, Eq. (7.4)
$\psi_{ec1,N} = \frac{1}{1 + \left(\frac{2 \cdot e_{N,1}}{s_{cr,N}}\right)} \leq 1.00$	EN 1992-4, Eq. (7.6)
$\psi_{ec2,N} = \frac{1}{1 + \left(\frac{2 \cdot e_{N,2}}{s_{cr,N}}\right)} \leq 1.00$	EN 1992-4, Eq. (7.6)
$\psi_{M,N} = 1$	EN 1992-4, Eq. (7.7)

$A_{c,N}$ [mm²]	$A^0_{c,N}$ [mm²]	$c_{cr,N}$ [mm]	$s_{cr,N}$ [mm]	$f_{c,cyl}$ [N/mm²]
735,300	1,299,600	570.0	1,140.0	40.00

$e_{c1,N}$ [mm]	$\psi_{ec1,N}$	$e_{c2,N}$ [mm]	$\psi_{ec2,N}$	$\psi_{s,N}$	$\psi_{re,N}$	z [mm]
0.0	1.000	0.0	1.000	0.739	1.000	66.6

$\psi_{M,N}$	k_1	$N^0_{Rk,c}$ [kN]	γ_{Mc}	$N_{Rd,c}$ [kN]	N_{Ed} [kN]
1.000	7.700	360.742	1.500	100.620	73.959

Group anchor ID
1

3.4 Splitting failure

$$N_{Ed} \leq N_{Rd,sp} = \frac{N_{Rk,sp}}{\gamma_{Msp}}$$ EN 1992-4, Table 7.1

$$N_{Rk,sp} = N^0_{Rk,sp} \cdot \frac{A_{c,N}}{A^0_{c,N}} \cdot \psi_{s,N} \cdot \psi_{re,N} \cdot \psi_{ec1,N} \cdot \psi_{ec2,N} \cdot \psi_{h,sp}$$ EN 1992-4, Eq. (7.23)

$$N^0_{Rk,sp} = \min\left(N^0_{Rk,p}, N^0_{Rk,c}\right)$$

$$A^0_{c,N} = s_{cr,sp} \cdot s_{cr,sp}$$ EN 1992-4, Eq. (7.3)

$$\psi_{s,N} = 0.7 + 0.3 \cdot \frac{c}{c_{cr,sp}} \leq 1.00$$ EN 1992-4, Eq. (7.4)

$$\psi_{ec1,N} = \frac{1}{1 + \left(\frac{2 \cdot e_{N,1}}{s_{cr,sp}}\right)} \leq 1.00$$ EN 1992-4, Eq. (7.6)

$$\psi_{ec2,N} = \frac{1}{1 + \left(\frac{2 \cdot e_{N,2}}{s_{cr,sp}}\right)} \leq 1.00$$ EN 1992-4, Eq. (7.6)

$$\psi_{h,sp} = \left(\frac{h}{h_{min}}\right)^{2/3} \leq \max\left\{1; \left(\frac{h_{ef} + 1.5 \cdot c_1}{h_{min}}\right)^{2/3}\right\} \leq 2.00$$ EN 1992-4, Eq. (7.24)

$A_{c,N}$ [mm^2]	$A^0_{c,N}$ [mm^2]	$c_{cr,sp}$ [mm]	$s_{cr,sp}$ [mm]	h_{min} [mm]	$\psi_{h,sp}$	$f_{c,cyl}$ [N/mm^2]
345,800	577,600	380.0	760.0	440.0	1.078	40.00

$e_{c1,N}$ [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	0.759	1.000	7.700

$N^0_{Rk,sp}$ [kN]	γ_{Msp}	$N_{Rd,sp}$ [kN]	N_{Ed} [kN]
328.189	1.500	107.208	73.959

Group anchor ID
1

4 Shear load (EN 1992-4, Section 7.2.2)

	Load [kN]	Capacity [kN]	Utilization β_V [%]	Status
Steel failure (without lever arm)*	43.546	48.214	91	OK
Steel failure (with lever arm)*	N/A	N/A	N/A	N/A
Pryout failure**	43.546	194.513	23	OK
Concrete edge failure in direction y-**	17.976	50.496	36	OK

* highest loaded anchor **anchor group (relevant anchors)
When the input edge distance is set to "infinity", edge breakout verification is not performed in that direction

4.1 Steel failure (without lever arm)

$V_{Ed} \leq V_{Rd,s} = \frac{V_{Rk,s}}{\gamma_{Ms}}$ EN 1992-4, Table 7.2

$V_{Rk,s} = k_7 \cdot V^0_{Rk,s}$ EN 1992-4, Eq. (7.35)

$V^0_{Rk,s}$ [kN]	k_7	$V_{Rk,s}$ [kN]	γ_{Ms}	$V_{Rd,s}$ [kN]	V_{Ed} [kN]
114.750	1.000	114.750	2.380	48.214	43.546

4.2 Pryout failure (bond relevant)

$V_{Ed} \leq V_{Rd,cp} = \frac{V_{Rk,cp}}{\gamma_{Mc,p}}$		EN 1992-4, Table 7.2
$V_{Rk,cp}$	$= k_8 \cdot \min\{N_{Rk,c}; N_{Rk,p}\}$	EN 1992-4, Eq. (7.39c)
$N_{Rk,p}$	$= N^0_{Rk,p} \cdot \frac{A_{p,N}}{A^0_{p,N}} \cdot \psi_{g,Np} \cdot \psi_{s,Np} \cdot \psi_{re,Np} \cdot \psi_{ec1,Np} \cdot \psi_{ec2,Np}$	EN 1992-4, Eq. (7.13)
$N^0_{Rk,p}$	$= \psi_{sus} \cdot \tau_{Rk} \cdot \pi \cdot d \cdot h_{ef}$	EN 1992-4, Eq. (7.14)
ψ_{sus}	$= 1$	EN 1992-4, Eq. (7.14a)
$s_{cr,Np}$	$= 7.3 \cdot d \cdot \sqrt{\psi_{sus} \cdot \tau_{Rk}} \leq 3 \cdot h_{ef}$	EN 1992-4, Eq. (7.15)
$\psi_{g,Np}$	$= \psi^0_{g,Np} - \left(\frac{s}{s_{cr,Np}}\right)^{0,5} \cdot \left(\psi^0_{g,Np} - 1\right) \geq 1.00$	EN 1992-4, Eq. (7.17)
$\psi^0_{g,Np}$	$= \sqrt{n} - (\sqrt{n} - 1) \cdot \left(\frac{\tau_{Rk}}{\tau_{Rk,c}}\right)^{1,5} \geq 1.00$	EN 1992-4, Eq. (7.18)
$\tau_{Rk,c}$	$= \frac{k_3}{\pi \cdot d} \cdot \sqrt{h_{ef} \cdot f_{ck}}$	EN 1992-4, Eq. (7.19)
$\psi_{s,Np}$	$= 0.7 + 0.3 \cdot \frac{c}{c_{cr,Np}} \leq 1.00$	EN 1992-4, Eq. (7.20)
$\psi_{ec1,Np}$	$= \frac{1}{1 + \left(\frac{2 \cdot e_{c1,N}}{s_{cr,Np}}\right)} \leq 1.00$	EN 1992-4, Eq. (7.21)
$\psi_{ec2,Np}$	$= \frac{1}{1 + \left(\frac{2 \cdot e_{c2,N}}{s_{cr,Np}}\right)} \leq 1.00$	EN 1992-4, Eq. (7.21)

$A_{p,N}$ [mm²]	$A^0_{p,N}$ [mm²]	$\tau_{Rk,ucr,20}$ [N/mm²]	$s_{cr,Np}$ [mm]	$c_{cr,Np}$ [mm]	c_{min} [mm]	$f_{c,cyl}$ [N/mm²]
412,353	699,271	18.00	836.2	418.1	75.0	40.00

ψ_c	$\tau_{Rk,cr}$ [N/mm²]	k_3	$\tau_{Rk,c}$ [N/mm²]	k_8	$\psi^0_{g,Np}$
1.072	10.18	7.700	11.19	2.000	1.000

$\psi_{g,Np}$	$e_{c1,V}$ [mm]	$\psi_{ec1,Np}$	$e_{c2,V}$ [mm]	$\psi_{ec2,Np}$	$\psi_{s,Np}$
1.000	0.0	1.000	0.0	1.000	0.754

$\psi_{re,Np}$	ψ^0_{sus}	α_{sus}	ψ_{sus}
1.000	0.800	0.000	1.000

$N^0_{Rk,p}$ [kN]	$N_{Rk,p}$ [kN]	$\gamma_{Mc,p}$	$V_{Rd,cp}$ [kN]	V_{Ed} [kN]
328.189	145.885	1.500	194.513	43.546

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4.3 Concrete edge failure in direction y-

$$V_{Ed} \leq V_{Rd,c} = \frac{V_{Rk,c}}{\gamma_{Mc}}$$ EN 1992-4, Table 7.2

$$V_{Rk,c} = k_T \cdot V^0_{Rk,c} \cdot \frac{A_{c,V}}{A^0_{c,V}} \cdot \psi_{s,V} \cdot \psi_{h,V} \cdot \psi_{\alpha,V} \cdot \psi_{ec,V} \cdot \psi_{re,V}$$ EN 1992-4, Eq. (7.40)

$$V^0_{Rk,c} = k_9 \cdot d^{\alpha}_{nom} \cdot l^{\beta}_f \cdot \sqrt{f_{ck}} \cdot c_1^{1,5}$$ EN 1992-4, Eq. (7.41)

$$\alpha = 0.1 \cdot \left(\frac{l_f}{c_1}\right)^{0,5}$$ EN 1992-4, Eq. (7.42)

$$\beta = 0.1 \cdot \left(\frac{d_{nom}}{c_1}\right)^{0,2}$$ EN 1992-4, Eq. (7.43)

$$A^0_{c,V} = 4.5 \cdot c_1^2$$ EN 1992-4, Eq. (7.44)

$$\psi_{s,V} = 0.7 + 0.3 \cdot \frac{c_2}{1.5 \cdot c_1} \leq 1.00$$ EN 1992-4, Eq. (7.45)

$$\psi_{h,V} = \left(\frac{1.5 \cdot c_1}{h}\right)^{0,5} \geq 1.00$$ EN 1992-4, Eq. (7.46)

$$\psi_{ec,V} = \frac{1}{1 + \left(\frac{2 \cdot e_V}{3 \cdot c_1}\right)} \leq 1.00$$ EN 1992-4, Eq. (7.47)

$$\psi_{90°,V} = 4.0 \cdot k_4 \cdot \left(\frac{n_2 \cdot d^2_{nom} \cdot f_{ck}}{V_{Rk,c,\perp}}\right)^{0,5} \leq 4.00$$ fib Bulletin 58, Eq. (10.2-5f$_1$)

$$\psi_{\alpha,V} = \sqrt{\frac{1}{(\cos \alpha_V)^2 + \left(\frac{\sin \alpha_V}{\psi_{90°,V}}\right)^2}} \geq 1.00$$ fib Bulletin 58, Eq. (10.2-5f))

l_f [mm]	d_{nom} [mm]	k_9	α	β	$f_{c,cyl}$ [N/mm^2]	c_1 [mm]
216.0	27.00	1.700	0.170	0.082	40.00	75.0

$A_{c,V}$ [mm^2]	$A^0_{c,V}$ [mm^2]	$\psi_{s,V}$	$\psi_{h,V}$	$e_{c,V}$ [mm]	$\psi_{ec,V}$
25,312	25,312	1.000	1.000	0.0	1.000

k_4	n_2	$V_{Rk,c,\perp}$ [kN]	$\psi_{90°,V}$	α_V [°]	$\psi_{\alpha,V}$	$\psi_{re,V}$
1.0	1	18.936	4.000	90.00	4.000	1.000

$V^0_{Rk,c}$ [kN]	k_T	γ_{Mc}	$V_{Rd,c}$ [kN]	V_{Ed} [kN]
18.936	1.0	1.500	50.496	17.976

Group anchor ID
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When the input edge distance is set to "infinity", edge breakout verification is not performed in that direction

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5 Combined tension and shear loads (EN 1992-4, Section 7.2.3)

Steel failure

β_N	β_V	α	Utilization $\beta_{N,V}$ [%]	Status
0.922	0.903	2.000	167	not recommended

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

Concrete failure

β_N	β_V	α	Utilization $\beta_{N,V}$ [%]	Status
0.760	0.356	1.500	88	OK

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

6 Displacements (highest loaded anchor)

Short term loading:

N_{Sk} = 52.828 [kN]		δ_N = 0.1147 [mm]	
V_{Sk} = 31.104 [kN]		δ_V = 0.9331 [mm]	
		δ_{NV} = 0.9401 [mm]	

Long term loading:

N_{Sk} = 52.828 [kN]		δ_N = 0.2622 [mm]	
V_{Sk} = 31.104 [kN]		δ_V = 1.5552 [mm]	
		δ_{NV} = 1.5771 [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 baseplate! 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 baseplates 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 baseplate are not considered - the baseplate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Engineering calculates the minimum required baseplate thickness with CBFEM to limit the stress of the baseplate based on the assumptions explained above. The proof if the rigid baseplate 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!
- The equations presented in this report are based on metric units. When inputs are displayed in imperial units, the user should be aware that the equations remain in their metric format.
- Checking the transfer of loads into the base material is required in accordance with EN 1992-4, Annex A!
- The design is only valid if the clearance hole in the fixture is not larger than the value given in Table 6.1 of EN 1992-4! For larger diameters of the clearance hole see section 6.2.2 of EN 1992-4!
- 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.
- For the determination of the $\psi_{re,v}$ (concrete edge failure) the minimum concrete cover defined in the design settings is used as the concrete cover of the edge reinforcement.
- Drilled hole cleaning must be performed according to instructions for use (blow twice with oil-free compressed air (min. 6 bar), brush twice, blow twice with oil-free compressed air (min. 6 bar)).
- Characteristic bond resistances depend on short- and long-term temperatures.
- Edge reinforcement is not required to avoid splitting failure
- Design is only valid if hole is filled to remove clearance, clearance as per EN 1992-4 Table 6.1
- The characteristic bond resistances depend on the return period (service life in years): 50

Fastening does not meet the design criteria!

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8 Installation data

Baseplate, 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 = 30.0 mm

Plate thickness (input): 15.0 mm

Recommended plate thickness: not calculated

Drilling method: Hammer drilled

Cleaning: Compressed air cleaning of the drilled hole according to instructions for use is required

Anchor type and size: HIT-HY 200-A V3 + HAS-U A4 M27

Item number: not available (insert) / 2378172 HIT-HY 200-A V3 (mortar)

Maximum installation torque: 270 Nm

Hole diameter in the base material: 30.0 mm

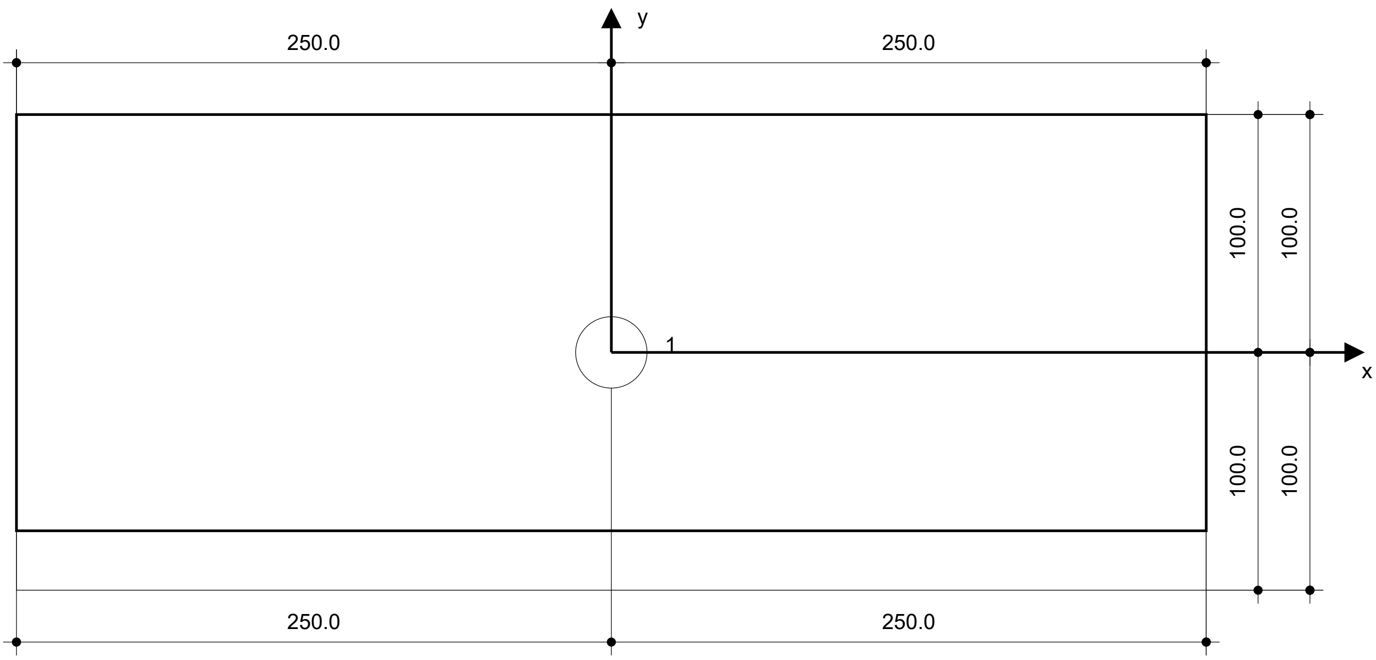
Hole depth in the base material: 380.0 mm

Minimum thickness of the base material: 440.0 mm

Hilti HAS-U A4 threaded rod with HIT-HY 200-A V3 injection mortar with 380 mm embedment hef, M27, Stainless steel, Hammer drill bit installation per ETA 19/0601, with annular gaps filled with Hilti Filling Set or any suitable gap solutions

8.1 Recommended accessories

Drilling	Cleaning	Setting
• Suitable Rotary Hammer • Properly sized drill bit	• Compressed air with required accessories to blow from the bottom of the hole • Proper diameter wire brush	• Dispenser including cassette and mixer • For deep installations, a piston plug is necessary • Torque wrench



Coordinates Anchor [mm]

Anchor	x	y	c_{-x}	c_{+x}	c_{-y}	c_{+y}
1	0.0	0.0	-	-	75.0	715.0

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.