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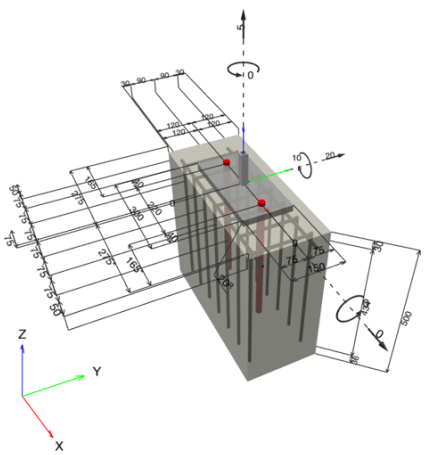
Specifier's comments:

1 Input data

Anchor type and diameter:	**Threaded rod with nut and washer 5.8 M20**
Effective embedment depth:	h_{ef} = 400.0 mm
Material:	5.8
Evaluation Service Report:	-
Issued I Valid:	- | -
Proof:	Design Method EN 1992-4, CastInPlace
Stand-off installation:	e_b = 0.0 mm (no stand-off); t = 20.0 mm
Anchor plate[R]:	l_x x l_y x t = 300.0 mm x 150.0 mm x 20.0 mm; (Recommended plate thickness: not calculated)
Profile:	Square hollow, 20 x 20 x 2; (L x W x T) = 20.0 mm x 20.0 mm x 2.0 mm
Base material:	cracked concrete, C32/40, $f_{c,cyl}$ = 32.00 N/mm^2; h = 500.0 mm, User-defined partial material safety factor γ_c = 1.500
Reinforcement:	no reinforcement or reinforcement spacing >= 150 mm (any Ø) or >= 100 mm (Ø <= 10 mm) no longitudinal edge reinforcement Reinforcement to control splitting acc. to EN 1992-4, 7.2.1.7 (2) b) 2) present Supplementary reinforcement for tension : C-Shape Ø10.0 mm//75.0 mm, $f_{yk,re}$= 500.00 N/mm^2, β = 100% Surface reinforcement for tension : Ø10.0 mm, $f_{yk,re}$= 500.00 N/mm^2, β = 0% Direction of casting: z+ Tolerance: 30.0 mm Supplementary reinforcement for edge y+: C-Shape Ø10.0 mm//75.0 mm, $f_{yk,re}$= 500.00 N/mm^2, β = 100% Surface reinforcement for edge y+: Ø10.0 mm, $f_{yk,re}$= 500.00 N/mm^2, β = 0% Direction of casting: z+ Tolerance: 30.0 mm

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

Geometry [mm] & Loading [kN, kNm]



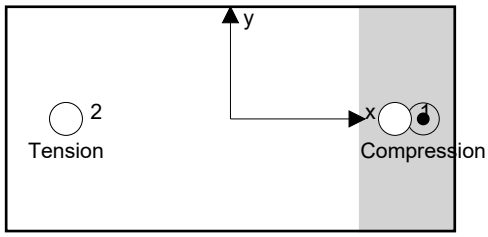
1.1 Load combination

Case	Description	Forces [kN] / Moments [kNm]	Seismic	Fire	Max. Util. Anchor [%]
1	Combination 1	N = 5.000; V_x = 0.000; V_y = 20.000; M_x = 0.000; M_y = 10.000; M_z = 0.000;	no	no	∞

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	0.000	10.000	0.000	10.000
2	44.551	10.000	0.000	10.000



max. concrete compressive strain: 0.28 [‰]
max. concrete compressive stress: 8.34 [N/mm²]
resulting tension force in (x/y)=(-110.0/0.0): 44.551 [kN]
resulting compression force in (x/y)=(128.9/0.0): 39.551 [kN]

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

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3 Tension load EN 1992-4, Section 7.2.1

	Load [kN]	Capacity [kN]	Utilization β_N [%]	Status
Steel Strength*	44.551	84.933	53	OK
Pullout Strength*	44.551	62.832	71	OK
Concrete blowout failure in direction x-**	44.551	20.564	217	not recommended
Concrete Breakout Failure**	N/A	N/A	N/A	N/A
Splitting failure**	N/A	N/A	N/A	N/A
Steel failure of longitudinal rebar**	1.003	34.148	3	OK
Steel failure of supplementary reinforcement, horizontal**	0.000	0.000	∞	not recommended
Steel failure of supplementary reinforcement, vertical**	0.000	0.000	∞	not recommended
Reinforcement anchorage inside of the breakout body, vertical**	0.000	0.000	∞	not recommended

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

3.1 Steel Strength

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

$N_{Rk,s}$ [kN]	$\gamma_{M,s}$	$N_{Rd,s}$ [kN]	N_{Ed} [kN]
127.400	1.500	84.933	44.551

3.2 Pullout Strength

$$N_{Ed} \leq N_{Rd,p} = \frac{N_{Rk,p}}{\gamma_{M,p}}$$ EN 1992-4, Table7.1

$$N_{Rk,p} = k_2 \cdot A_h \cdot f_{ck}$$ EN 1992-4, Eq. (7.11)

k_2	A_h [mm²]	f_{ck} [N/mm²]
7.500	393	32.00

$N_{Rk,p}$ [kN]	$\gamma_{M,p}$	$N_{Rd,p}$ [kN]	N_{Ed} [kN]
94.248	1.500	62.832	44.551

3.3 Concrete blowout failure in direction x-

$$N_{Ed} \le N_{Rd,cb} = \frac{N_{Rk,cb}}{\gamma_{M,cb}}$$ EN 1992-4, Table (7.1)

$$N_{Rk,cb} = N^0_{Rk,cb} \cdot \frac{A_{c,Nb}}{A^0_{c,Nb}} \cdot \psi_{s,Nb} \cdot \psi_{g,Nb} \cdot \psi_{ec,Nb}$$ EN 1992-4, Eq. (7.25)

$$N^0_{Rk,cb} = k_5 \cdot c_1 \cdot \sqrt{A_h} \cdot \sqrt{f_{ck}}$$ EN 1992-4, Eq. (7.26)

$$A^0_{c,Nb} = (4 \cdot c_1)^2$$ EN 1992-4, Eq. (7.27)

$$\psi_{s,Nb} = 0.7 + 0.3 \frac{c_2}{2 \cdot c_1} \le 1.00$$ EN 1992-4, Eq. (7.28)

$$\psi_{g,Nb} = \sqrt{n} + (1-\sqrt{n}) \cdot \frac{s_2}{4 \cdot c_1} \ge 1.00$$ EN 1992-4, Eq. (7.29)

$$\psi_{ec,Nb} = \frac{1}{1+\frac{2 \cdot e_N}{4 \cdot c_1}} \le 1.00$$ EN 1992-4, Eq. (7.30)

k_5	c_1 [mm]	A_h [mm²]	f_{ck} [N/mm²]	$N^0_{Rk,cb}$ [kN]	$A^0_{c,Nb}$ [mm²]	c_2 [mm]
8.700	165.0	393	32.00	160.919	435,600	120.0

s_2 [mm]	f [mm]	$A_{c,Nb}$ [mm²]	$\psi_{s,Nb}$	$\psi_{g,Nb}$	$\psi_{ec,Nb}$
-	100.0	103,200	0.809	1.000	1.000

$N_{Rk,cb}$ [kN]	$\gamma_{M,cb}$	$N_{Rd,cb}$ [kN]	N_{Ed} [kN]
30.846	1.500	20.564	44.551

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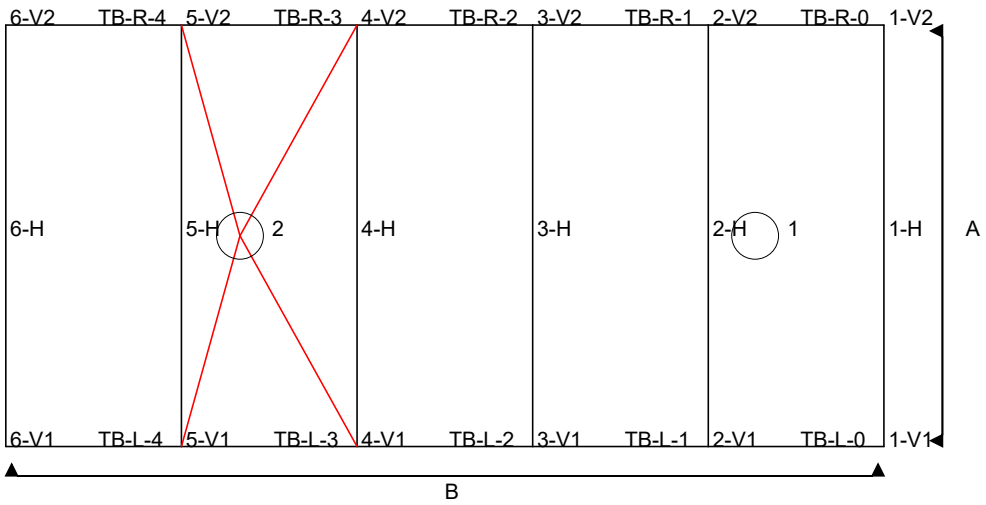
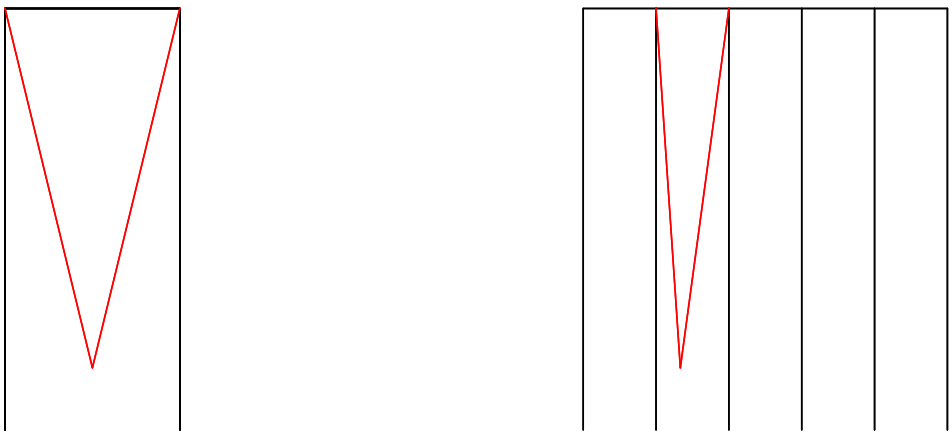
3.4 Supplementary reinforcement - tension (EN 1992-4 section 7.2.1.2 and 7.2.1.9)

Strut and tie model





A B

Rebar Forces

Rebar	Type	Orientation	Tension force [kN]
TB (surface reinforcement)	Straight	horizontal	1.003
1	C-Shape	vertical 1 (1-V1)	0.000
		vertical 2 (1-V2)	0.000
		horizontal (1-H)	0.000
2	C-Shape	vertical 1 (2-V1)	0.000

Rebar	Type	Orientation	Tension force [kN]
		vertical 2 (2-V2)	0.000
		horizontal (2-H)	0.000
3	C-Shape	vertical 1 (3-V1)	0.000
		vertical 2 (3-V2)	0.000
		horizontal (3-H)	0.000
4	C-Shape	vertical 1 (4-V1)	7.425
		vertical 2 (4-V2)	7.425
		horizontal (4-H)	1.806
5	C-Shape	vertical 1 (5-V1)	14.850
		vertical 2 (5-V2)	14.850
		horizontal (5-H)	3.612
6	C-Shape	vertical 1 (6-V1)	0.000
		vertical 2 (6-V2)	0.000
		horizontal (6-H)	0.000

Most unfavorable tolerance: 15.0 mm

3.4.1 Steel failure of longitudinal rebar

$$N_{Ed,re} \leq N_{Rd,re} = \frac{N_{Rk,re}}{\gamma_{Ms,re}}$$
$$N_{Rk,re} = A_{s,re} \cdot f_{yk,re}$$

$d_{s,re}$ [mm]	$A_{s,re}$ [mm²]	$f_{yk,re}$ [N/mm²]
10.0	79	500.00

$N_{Ed,re}$ [kN]	$N_{Rk,re}$ [kN]	$\gamma_{Ms,re}$	β_{re} [%]	$N_{Rd,re}$ [kN]
1.003	39.270	1.150	0	34.148

3.4.2 Steel failure of supplementary reinforcement, horizontal

$$N_{Ed,re} \leq N_{Rd,re} = \frac{N_{Rk,re}}{\gamma_{Ms,re}}$$
$$N_{Rk,re} = A_{s,re} \cdot f_{yk,re}$$

$d_{s,re}$ [mm]	$A_{s,re}$ [mm²]	$f_{yk,re}$ [N/mm²]
10.0	79	500.00

$N_{Ed,re}$ [kN]	$N_{Rk,re}$ [kN]	$\gamma_{Ms,re}$	β_{re} [%]	$N_{Rd,re}$ [kN]
0.000	39.270	1.150	100	0.000

3.4.3 Steel failure of supplementary reinforcement, vertical

$$N_{Ed,re} \le N_{Rd,re} = \frac{N_{Rk,re}}{\gamma_{Ms,re}}$$
$$N_{Rk,re} = A_{s,re} \cdot f_{yk,re}$$

$d_{s,re}$ [mm]	$A_{s,re}$ [mm²]	$f_{yk,re}$ [N/mm²]
10.0	79	500.00

$N_{Ed,re}$ [kN]	$N_{Rk,re}$ [kN]	$\gamma_{Ms,re}$	β_{re} [%]	$N_{Rd,re}$ [kN]
0.000	39.270	1.150	100	0.000

3.4.4 Reinforcement anchorage inside of the breakout body, vertical

$$N_{ed,re} \le N_{Rd,a}$$
$$N_{Rd,a} = \frac{l_1 \cdot \pi \cdot d_{s,re} \cdot f_{bd}}{\alpha_1 \cdot \alpha_2} \le N_{Rd,re}$$

l_1 [mm]	$d_{s,re}$ [mm]	f_{bd} [N/mm²]
191.7	10.0	3.18

α_1	α_2	β_{re} [%]
0.700	0.700	100

$N_{Ed,re}$ [kN]	$N_{Rd,a}$ [kN]
0.000	0.000

Splice length outside of the assumed failure cone, vertical

Load transfer from supplementary reinforcement to the structural member shall be verified by the responsible structural engineer.

$$l_0 = \alpha_1 \cdot \alpha_2 \cdot \alpha_{3,5} \cdot \alpha_6 \cdot l_{b,rqd} \cdot = \alpha_1 \cdot \alpha_2 \cdot \alpha_{3,5} \cdot \alpha_6 \cdot \frac{d_{s,re}}{4} \cdot \frac{\sigma_{sd,re}}{f_{bd}} \ge l_{0,min}$$
$$l_{0,min} = \max(0.3 \cdot \alpha_6 \cdot l_{b,rqd}, 15 \cdot d_{s,re}, 200.0 \text{ mm})$$
$$l_{b,rqd} = \frac{d_{s,re}}{4} \cdot \frac{\sigma_{sd,re}}{f_{bd}}$$

α_1	α_2	$\alpha_{3,5}$	α_6
1.000	0.906	1.000	1.500

$\sigma_{sd,re}$ [N/mm²]	β_{re} [%]	l_0 [mm]	$l_{0,min}$ [mm]
189.08	100	202.4	200.0

4 Shear load EN 1992-4, Section 7.2.2

	Load [kN]	Capacity [kN]	Utilization β_V [%]	Status
Steel Strength (without lever arm)*	10.000	50.960	20	OK
Steel failure (with lever arm)*	N/A	N/A	N/A	N/A
Pryout Strength**	20.000	86.192	24	OK
Concrete edge failure in direction x-**	10.000	22.902	44	OK
Steel failure of longitudinal rebar, edge y+**	1.404	33.144	5	OK
Steel failure of supplementary reinforcement, edge y+**	4.817	0.000	∞	not recommended
Reinforcement anchorage inside of the breakout body, edge y+**	4.817	0.000	∞	not recommended

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

4.1 Steel Strength (without lever arm)

$V_{Ed} \leq V_{Rd,s} = \frac{V_{Rk,s}}{\gamma_{M,s}}$ 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]	$\gamma_{M,s}$	$V_{Rd,s}$ [kN]	V_{Ed} [kN]
63.700	1.000	63.700	1.250	50.960	10.000

4.2 Pryout Strength

$V_{Ed} \le V_{Rd,cp} = \frac{V_{Rk,cp}}{\gamma_{M,c,p}}$ EN 1992-4, Table 7.2

$V_{Rk,cp} = k_8 \cdot N_{Rk,c}$ EN 1992-4, Eq. (7.39a)

$N_{Rk,c} = N^0_{Rk,c} \cdot \frac{A_{c,N}}{A^0_{c,N}} \cdot \psi_{s,N} \cdot \psi_{re,N} \cdot \psi_{ec1,N} \cdot \psi_{ec2,N} \cdot \psi_{M,N}$ 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)

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

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

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

$\psi_{M,N} = 1$ EN 1992-4, Eq. (7.7)

$h'_{ef} = \max\left(\frac{c_{max}}{c_{cr,N}}, \frac{s_{max}}{s_{cr,N}}\right) \cdot h_{ef}$ EN 1992-4, Eq. (7.9)

$A_{c,N}$ [mm²]	$A^0_{c,N}$ [mm²]	$c_{cr,N}$ [mm]	$s_{cr,N}$ [mm]	k_8	$f_{c,cyl}$ [N/mm²]
132,000	108,900	600.0	1,200.0	2.000	32.00

h'_{ef} [mm]	$c'_{cr,N}$ [mm]	$s'_{cr,N}$ [mm]
110.0	165.0	330.0

$e_{c1,V}$ [mm]	$\psi_{ec1,N}$	$e_{c2,V}$ [mm]	$\psi_{ec2,N}$	$\psi_{s,N}$	$\psi_{re,N}$	$\psi_{M,N}$
0.0	1.000	0.0	1.000	0.918	1.000	1.000

k_1	$N^0_{Rk,c}$ [kN]	$\gamma_{M,c,p}$	$V_{Rd,cp}$ [kN]	V_{Ed} [kN]
8.900	58.084	1.500	86.192	20.000

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4.3 Concrete edge failure in direction x-

$$V_{Ed} \le V_{Rd,c} = \frac{V_{Rk,c}}{\gamma_{M,c}}$$ 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)

$$V^0_{Rk,c} = k_9 \cdot d_{nom}^{\alpha} \cdot l_f^{\beta} \cdot \sqrt{f_{ck}} \cdot c_1^{1,5}$$ 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)

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

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

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

$$\psi_{\alpha,V} = \sqrt{\frac{1}{(\cos \alpha_V)^2 + (0.5 \cdot \sin \alpha_V)^2}} \ge 1.00$$ EN 1992-4, Eq. (7.48)

l_f [mm]	d_{nom} [mm]	k_9	α	β	$f_{c,cyl}$ [N/mm²]
240.0	20.00	1.700	0.121	0.066	32.00

c_1 [mm]	$A_{c,V}$ [mm²]	$A^0_{c,V}$ [mm²]
165.0	59,400	122,512

$\psi_{s,V}$	$\psi_{h,V}$	$\psi_{\alpha,V}$	$e_{c,V}$ [mm]	$\psi_{ec,V}$	$\psi_{re,V}$
0.845	1.000	2.000	0.0	1.000	1.000

$V^0_{Rk,c}$ [kN]	k_T	$\gamma_{M,c}$	$V_{Rd,c}$ [kN]	V_{Ed} [kN]
41.902	1.0	1.500	22.902	10.000

4.4 Supplementary reinforcement - shear (EN 1992-4 section 7.2.2.2 and 7.2.2.6)

Shear load eccentricity factor

$$N_{Ed,re} = V_{Ed} * \left(\frac{e_s}{z}+1\right)$$

$$e_s = e_c + \frac{t}{2} + c + \frac{d_{s,re}}{2}$$

$$z = 0.85 \cdot d$$

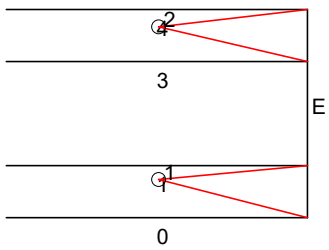
$$d = h - c - \frac{d_{s,re}}{2} \leq \min\left(2 \cdot h_{ef}, 2 \cdot c_1\right)$$

e_c [mm]	t [mm]	c [mm]	$d_{s,re}$ [mm]	e_s [mm]
0.0	20.0	149.5	10.0	164.5

h [mm]	d [mm]	h_{ef} [mm]	c_1 [mm]
500.0	240.0	400.0	120.0

z [mm]	$\frac{e_s}{z}+1$
204.0	1.806

Strut and tie model



Rebar Forces

Rebar	Type	Tension force [kN]
E (surface reinforcement)	Straight	1.404
0	C-Shape	4.817
1	C-Shape	13.247
3	C-Shape	6.021
4	C-Shape	12.042

Most unfavorable tolerance: 15.0 mm

4.4.1 Steel failure of longitudinal rebar, edge y+

$$N_{Ed,re} \le N_{Rd,re} = \frac{N_{Rk,re}}{\gamma_{Ms,re}}$$
$$N_{Rk,re} = K_{10} \cdot A_{s,re} \cdot f_{yk,re}$$

$d_{s,re}$ [mm]	K_{10}	$A_{s,re}$ [mm²]	$f_{yk,re}$ [N/mm²]
10.0	1.00	79	500.00

$N_{Ed,re}$ [kN]	$N_{Rk,re}$ [kN]	$\gamma_{Ms,re}$	β_{re} [%]	$N_{Rd,re}$ [kN]
1.404	39.270	1.150	3	33.144

4.4.2 Steel failure of supplementary reinforcement, edge y+

$$N_{Ed,re} \le N_{Rd,re} = \frac{N_{Rk,re}}{\gamma_{Ms,re}}$$
$$N_{Rk,re} = K_{10} \cdot A_{s,re} \cdot f_{yk,re}$$

$d_{s,re}$ [mm]	K_{10}	$A_{s,re}$ [mm²]	$f_{yk,re}$ [N/mm²]
10.0	1.00	79	500.00

$N_{Ed,re}$ [kN]	$N_{Rk,re}$ [kN]	$\gamma_{Ms,re}$	β_{re} [%]	$N_{Rd,re}$ [kN]
4.817	39.270	1.150	∞	0.000

4.4.3 Reinforcement anchorage inside of the breakout body, edge y+

$$N_{ed,re} \le N_{Rd,a}$$
$$N_{Rd,a} = \frac{l_1 \cdot \pi \cdot d_{s,re} \cdot f_{bd}}{\alpha_1 \cdot \alpha_2} \le N_{Rd,re}$$

l_1 [mm]	$d_{s,re}$ [mm]	c_1 [mm]	f_{bd} [N/mm²]
182.8	10.0	120.0	2.22

α_1	α_2	β_{re} [%]
0.700	0.700	∞

$N_{Ed,re}$ [kN]	$N_{Rd,a}$ [kN]
4.817	0.000

Splice length outside of the assumed failure cone

Load transfer from supplementary reinforcement to the structural member shall be verified by the responsible structural engineer.

$$l_0 = \alpha_1 \cdot \alpha_2 \cdot \alpha_{3,5} \cdot \alpha_6 \cdot l_{b,rqd} \cdot = \alpha_1 \cdot \alpha_2 \cdot \alpha_{3,5} \cdot \alpha_6 \cdot \frac{d_{s,re}}{4} \cdot \frac{\sigma_{sd,re}}{f_{bd}} \geq l_{0,min}$$

$$l_{0,min} = \max(0.3 \cdot \alpha_6 \cdot l_{b,rqd}, 15 \cdot d_{s,re}, 200.0 \text{ mm})$$

$$l_{b,rqd} = \frac{d_{s,re}}{4} \cdot \frac{\sigma_{sd,re}}{f_{bd}}$$

α_1	α_2	$\alpha_{3,5}$	α_6
1.000	0.906	1.000	1.500
$\sigma_{sd,re}$ [N/mm^2]	β_{re} [%]	l_0 [mm]	$l_{0,min}$ [mm]
168.66	∞	257.9	200.0

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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
0.525	0.196	2.000	32	OK

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

Concrete failure

β_N	β_V	α	Utilization $\beta_{N,V}$ [%]	Status
∞	∞	1.000	∞	not recommended

$(\beta_N + \beta_V) / 1.2 \leq 1.0$

6 Displacements (highest loaded anchor)

Short term loading:

N_{Sk} = 0.000 [kN]
V_{Sk} = 7.407 [kN]

δ_N = - [mm]
δ_V = - [mm]
δ_{NV} = - [mm]

Long term loading:

N_{Sk} = 0.000 [kN]
V_{Sk} = 7.407 [kN]

δ_N = - [mm]
δ_V = - [mm]
δ_{NV} = - [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!
- 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.
- Load transfer from supplementary reinforcement to the structural member shall be verified by the responsible structural engineer.
- With supplementary reinforcement and post-installed anchors, please ensure that in the jobsite the rebars are not drilled through.
- The designed fasteners should respect the product design conditions and recommendations by the manufacturer and in EN 1992-4, section F.3, such as welding procedures, installation, max. size of fixing, etc.
- The characteristic bond resistances depend on the return period (service life in years): 50

Fastening does not meet the design criteria!

8 Installation data

Anchor plate, steel: S 275; E = 210,000.00 N/mm^2; f_{yk} = 275.00 N/mm^2

Profile: Square hollow, 20 x 20 x 2; (L x W x T) = 20.0 mm x 20.0 mm x 2.0 mm

Hole diameter in the fixture: d_f = 22.0 mm

Plate thickness (input): 20.0 mm

Recommended plate thickness: not calculated

Anchor type and diameter: Threaded rod with nut and washer 5.8 M20

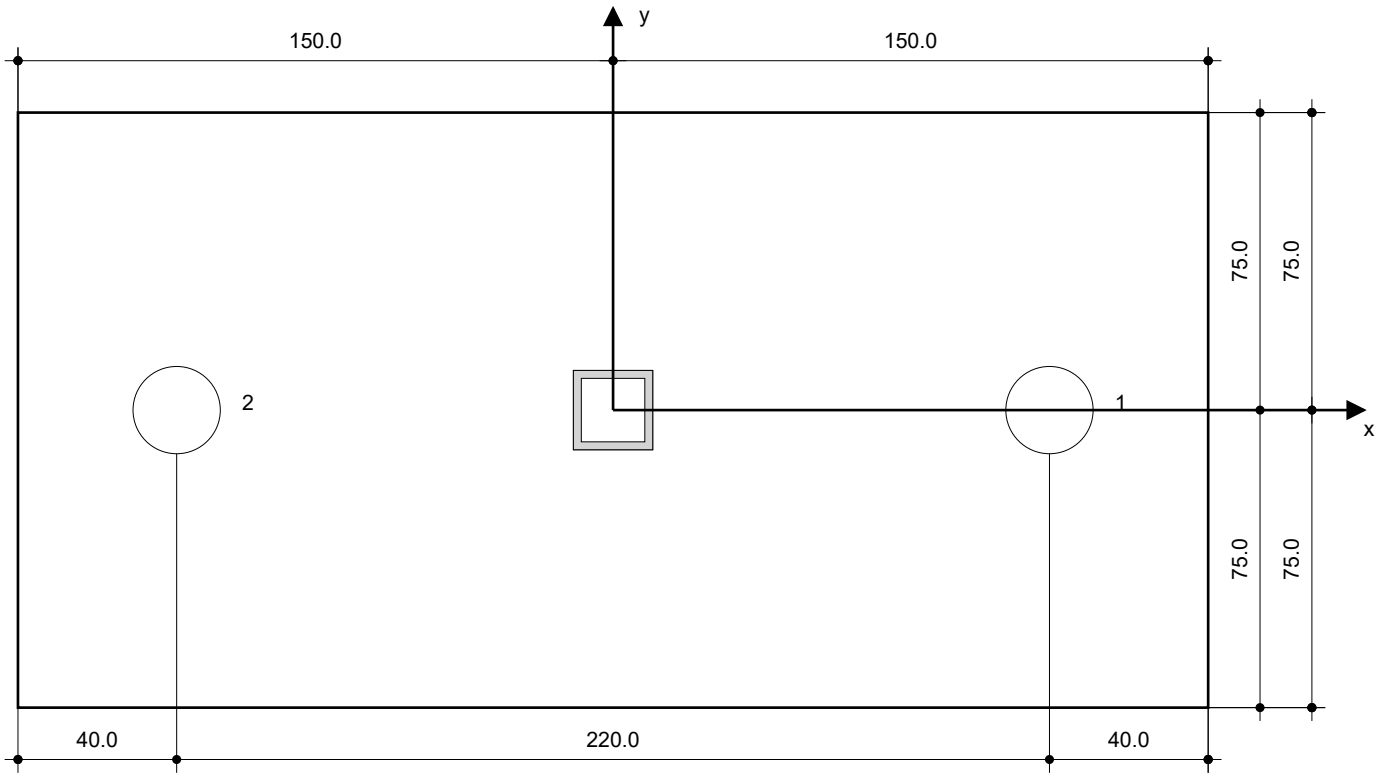
Item number: not available

Minimum thickness of the base material: 0.0 mm

Hilti Threaded rod with nut and washer threaded rod with nut with 400 mm embedment, M20, Steel galvanized, installation per -

8.1 Recommended accessories

Drilling	Cleaning	Setting
• -	• No accessory required	• -



Coordinates Anchor [mm]

Anchor	x	y	c_{-x}	c_{+x}	c_{-y}	c_{+y}
1	110.0	0.0	385.0	165.0	120.0	120.0
2	-110.0	0.0	165.0	385.0	120.0	120.0

9 Remarks; Your Cooperation Duties

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