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Specifier's comments:

1 Input data

Anchor type and diameter:	**HIT-HY 200-R + HIT-V-F (5.8) M8**
Effective embedment depth:	$h_{ef,opti}$ = 60 mm ($h_{ef,limit}$ = 160 mm)
Material:	5.8
Evaluation Service Report:	Hilti Technical Data
Issued I Valid:	- I -
Proof:	Design method Extended ETAG BOND (EOTA TR 029)
Stand-off installation:	e_b = 0 mm (no stand-off); t = 20 mm
Anchor plate:	l_x x l_y x t = 300 mm x 300 mm x 20 mm; (Recommended plate thickness: not calculated
Profile:	Cylinder; (L x W x T) = 10 mm x 10 mm x 0 mm
Base material:	cracked concrete, C12/15, f_{cc} = 15.00 N/mm^2; h = 250 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

Geometry [mm] & Loading [kN, kNm]
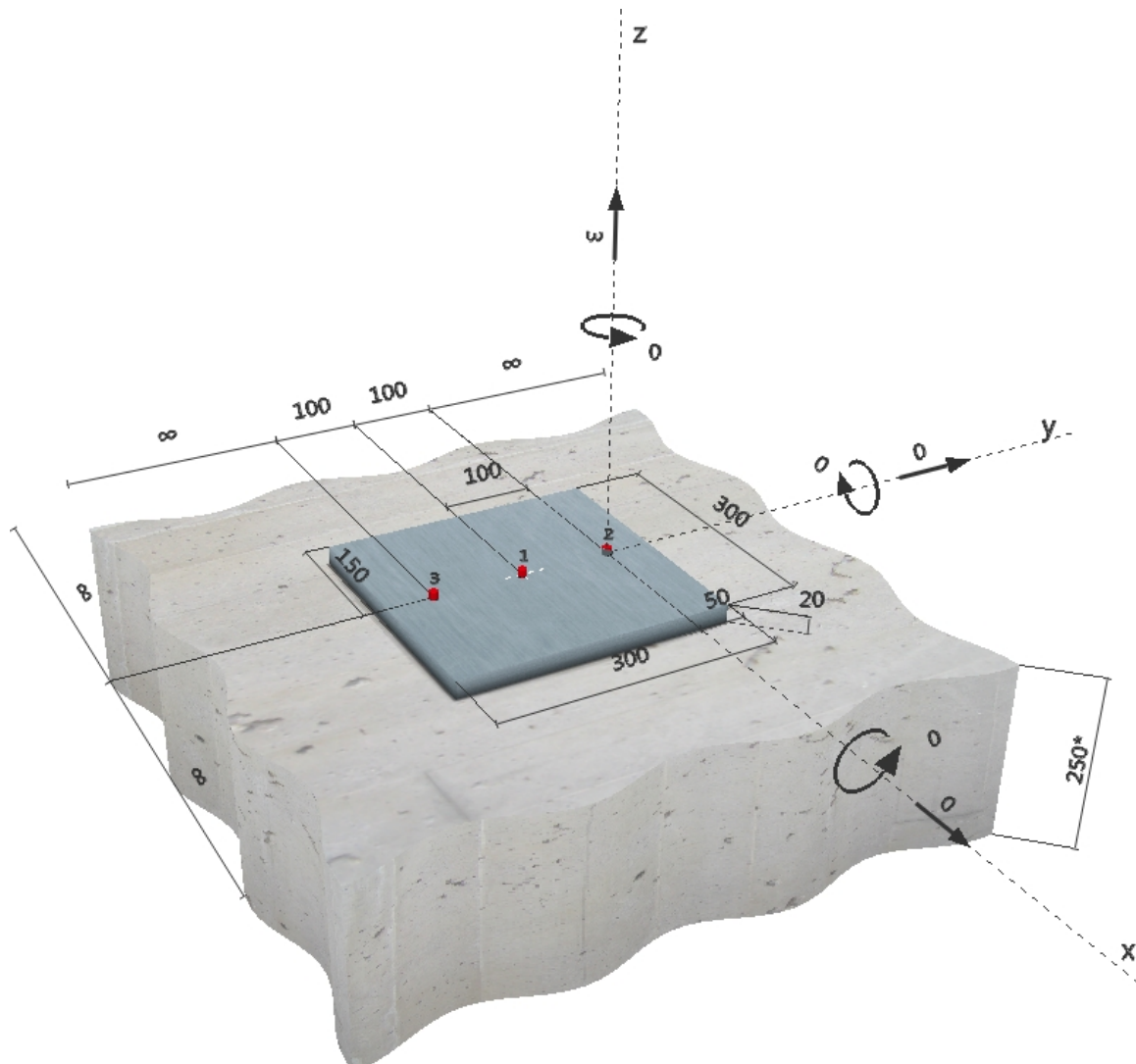
2 Load case/Resulting anchor forces

Load case: Design loads

Anchor reactions [kN]
Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	1.266	0.000	0.000	0.000
2	2.183	0.000	0.000	0.000
3	0.349	0.000	0.000	0.000

max. concrete compressive strain: 0.01 [‰]
max. concrete compressive stress: 0.45 [N/mm^2]
resulting tension force in (x/y)=(0/48):   3.799 [kN]
resulting compression force in (x/y)=(0/-146): 0.799 [kN]
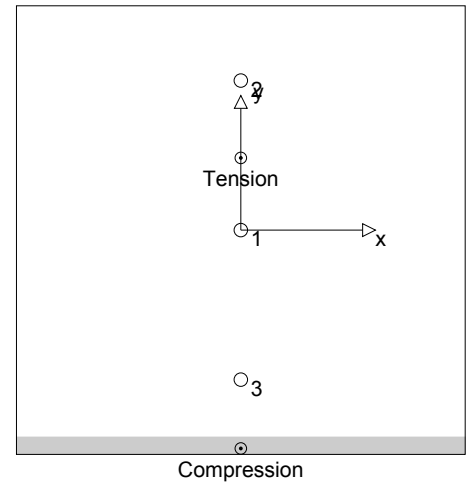
3 Tension load (EOTA TR 029, Section 5.2.2)

	Load [kN]	Capacity [kN]	Utilization β_N [%]	Status
Steel Strength*	2.183	12.000	19	OK
Combined pullout-concrete cone failure**	3.799	10.259	38	OK
Concrete Breakout Strength**	3.799	11.872	32	OK
Splitting failure**	N/A	N/A	N/A	N/A

* anchor having the highest loading   **anchor group (anchors in tension)

3.1 Steel Strength

$N_{Rk,s}$ [kN]	$\gamma_{M,s}$	$N_{Rd,s}$ [kN]	N_{Sd} [kN]
18.000	1.500	12.000	2.183

3.2 Combined pullout-concrete cone failure

$A_{p,N}$ [mm^2]	$A_{p,N}^0$ [mm^2]	$\tau_{Rk,ucr,25}$ [N/mm^2]	$s_{cr,Np}$ [mm]	$c_{cr,Np}$ [mm]	c_{min} [mm]
68400	32400	18.00	180	90	∞

ψ_c	$\tau_{Rk,cr}$ [N/mm^2]	k	$\psi_{g,Np}^0$	$\psi_{g,Np}$	
0.945	7.09	2.300	1.186	1.047	

$e_{c1,N}$ [mm]	$\psi_{ec1,Np}$	$e_{c2,N}$ [mm]	$\psi_{ec2,Np}$	$\psi_{s,Np}$	$\psi_{re,Np}$
0	1.000	48	0.651	1.000	1.000

$N_{Rk,p}^0$ [kN]	$N_{Rk,p}$ [kN]	$\gamma_{M,p}$	$N_{Rd,p}$ [kN]	N_{Sd} [kN]
10.692	15.389	1.500	10.259	3.799

3.3 Concrete Breakout Strength

$A_{c,N}$ [mm^2]	$A_{c,N}^0$ [mm^2]	$c_{cr,N}$ [mm]	$s_{cr,N}$ [mm]
68400	32400	90	180

$e_{c1,N}$ [mm]	$\psi_{ec1,N}$	$e_{c2,N}$ [mm]	$\psi_{ec2,N}$	$\psi_{s,N}$	$\psi_{re,N}$	k_1
0	1.000	48	0.651	1.000	1.000	7.200

$N_{Rk,c}^0$ [kN]	$\gamma_{M,c}$	$N_{Rd,c}$ [kN]	N_{Sd} [kN]
12.960	1.500	11.872	3.799

4 Shear load (EOTA TR 029, Section 5.2.3)

	Load [kN]	Capacity [kN]	Utilization β_V [%]	Status
Steel Strength (without lever arm)*	N/A	N/A	N/A	N/A
Steel failure (with lever arm)*	N/A	N/A	N/A	N/A
Pryout Strength*	N/A	N/A	N/A	N/A
Concrete edge failure in direction **	N/A	N/A	N/A	N/A

* anchor having the highest loading   **anchor group (relevant anchors)

5 Displacements (highest loaded anchor)

Short term loading:

N_{Sk}	=	1.617 [kN]		δ_N	=	0.075 [mm]
V_{Sk}	=	0.000 [kN]		δ_V	=	0.000 [mm]
				δ_{NV}	=	0.075 [mm]

Long term loading:

N_{Sk}	=	1.617 [kN]		δ_N	=	0.172 [mm]
V_{Sk}	=	0.000 [kN]		δ_V	=	0.000 [mm]
				δ_{NV}	=	0.172 [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!

6 Warnings

• Load re-distributions 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 loading!   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 EOTA TR 029, Section 7!

• The design is only valid if the clearance hole in the fixture is not larger than the value given in Table 4.1 of EOTA TR029! For larger diameters of the clearance hole see Chapter 1.1. of EOTA TR029!

• 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.

• Bore 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.

• Please contact Hilti to check feasibility of HIT-V rod supply.

• Edge reinforcement is not required to avoid splitting failure

Fastening meets the design criteria!

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7 Installation data

Anchor plate, steel: -
Profile: Cylinder; 10 x 10 x 0 mm
Hole diameter in the fixture: d_f = 9 mm
Plate thickness (input): 20 mm
Recommended plate thickness: not calculated
Cleaning: Premium cleaning of the drilled hole is required

Anchor type and diameter: HIT-HY 200-R + HIT-V-F (5.8) M8
Installation torque: 0.010 kNm
Hole diameter in the base material: 10 mm
Hole depth in the base material: 60 mm
Minimum thickness of the base material: 100 mm

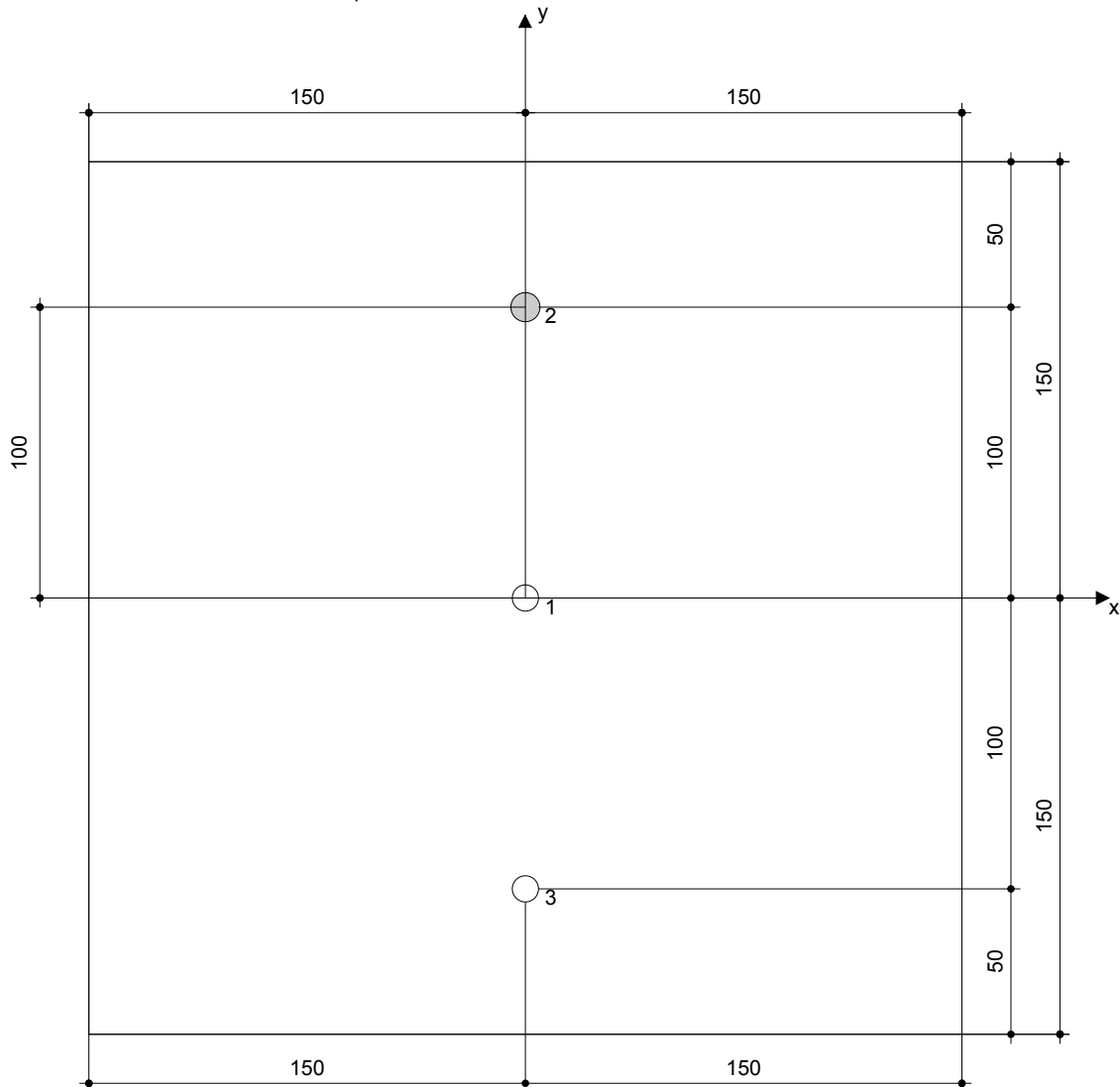## 7.1 Recommended accessories

Drilling
• Suitable Rotary Hammer
• Properly sized drill bit

Cleaning
• Compressed air with required accessories to blow from the bottom of the hole
• Proper diameter wire brush

Setting
• Dispenser including cassette and mixer
• Torque wrench

Coordinates Anchor [mm]

Anchor	x	y	c_{-x}	c_{+x}	c_{-y}	c_{+y}
1	0	0	-	-	-	-
2	0	100	-	-	-	-
3	0	-100	-	-	-	-

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8 Remarks; Your Cooperation Duties

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