

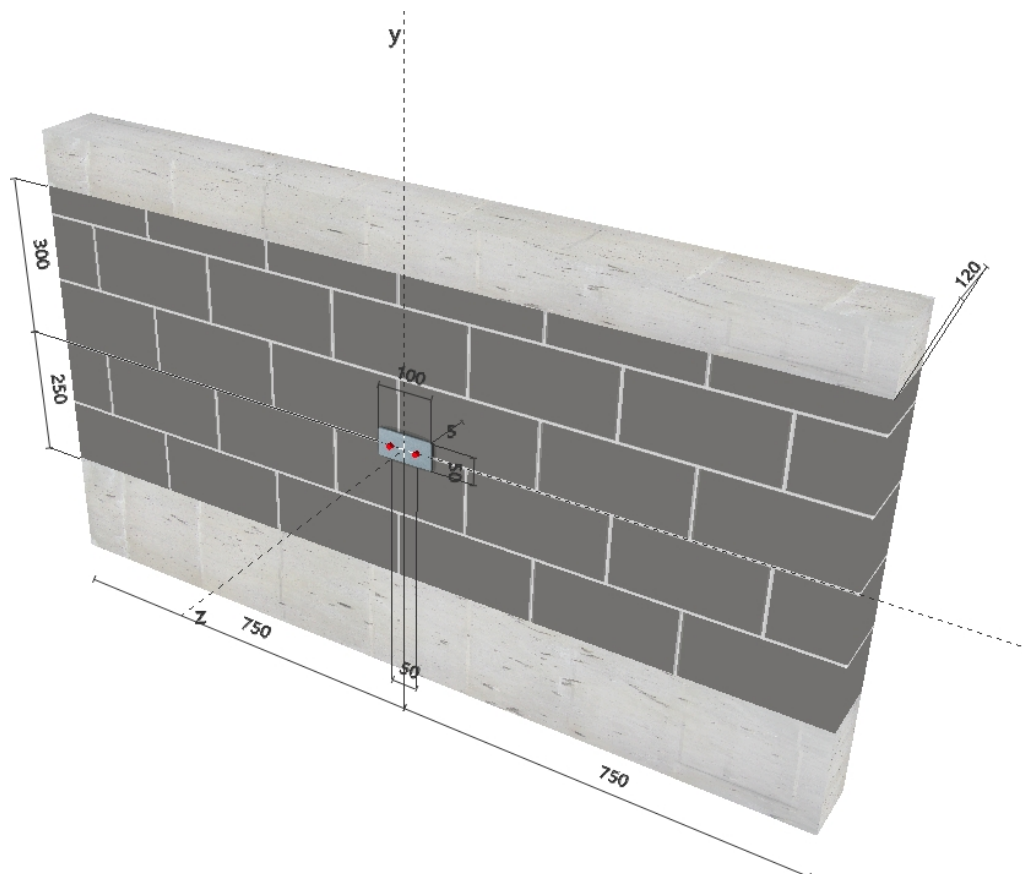
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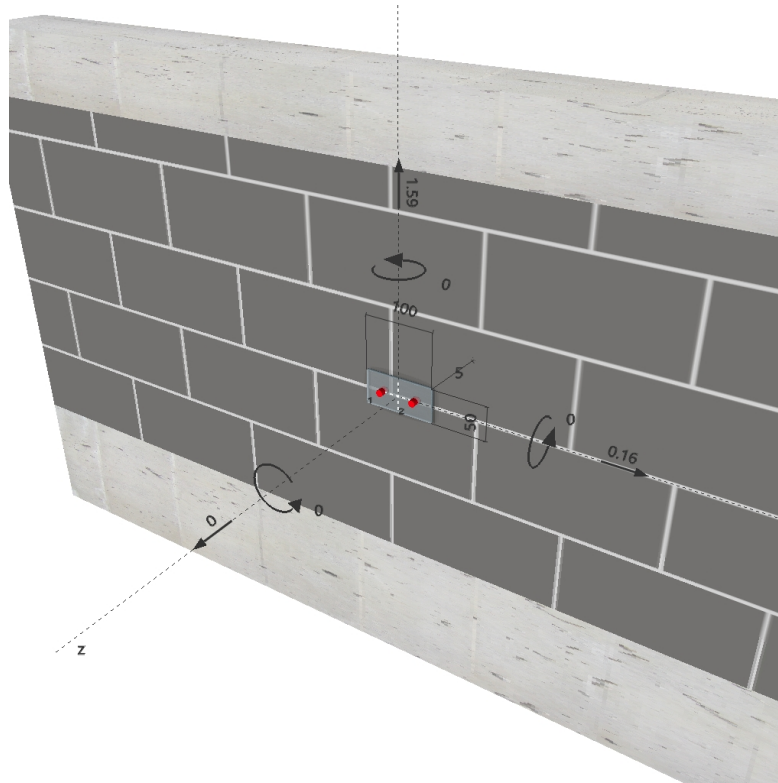
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**Specifier's comments:**
**1 Input data**


<b>Anchor type and diameter:</b>	<b>HIT-HY 270 + HIT-V-R M10</b>
Effective embedment depth:	$h_{ef,act} = 75 \text{ mm}$
Material:	A4
Evaluation Service Report:	ETA-13/1036
Issued   Valid:	4/28/2015   4/28/2020
Proof:	Design method ETAG 029, Annex C
Stand-off installation:	$e_b = 0 \text{ mm}$ (no stand-off); $t = 5 \text{ mm}$
Anchor plate:	$l_x \times l_y \times t = 100 \text{ mm} \times 50 \text{ mm} \times 5 \text{ mm}$ ; (Recommended plate thickness: not calculated)
Profile:	no profile
Base material:	Brick layout: Stretcher; Brick: Solid Vbl, 2DF, f=4 (solid brick), Light weight concrete, L x W x H: 250 mm x 120 mm x 120 mm; $f_{b,v} = 4.00 \text{ N/mm}^2$ ; $E_{wall} = 1,451.46 \text{ N/mm}^2$ Mortar: M2,5 - M9; Vertical joints filled: YES; vertical: 5 mm; horizontal: 5 mm
Installation/Use:	Installation condition: Dry; Use condition: Dry; Cleaning: compressed air Temp. short/long: 40/24 °C

**Geometry [mm]**


**Geometry [mm] & Loading [kN, kNm]**

**1.1 Load combination**

Case	Description	Forces [kN] / Moments [kNm]	Seismic	Fire	Max. Util. [%]
1	Max Shear	$V_x = 0.160$ ; $V_y = 1.590$ ; $N = 0.000$ ; $M_x = 0.000$ ; $M_y = 0.000$ ; $M_z = 0.000$ ;	no	no	160
2	Max Tension	$V_x = 0.070$ ; $V_y = 0.880$ ; $N = 0.840$ ; $M_x = 0.000$ ; $M_y = 0.000$ ; $M_z = 0.000$ ;	no	no	124

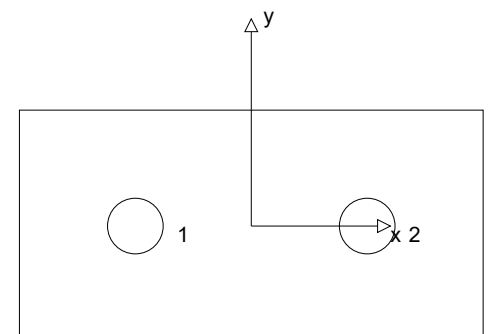
**2 Load case/Resulting anchor forces**

Load case: Design loads

**Anchor reactions [kN]**

Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	0.000	0.799	0.080	0.795
2	0.000	0.799	0.080	0.795

 max. compressive strain: - [%]  
 max. compressive stress: - [N/mm<sup>2</sup>]  
 resulting tension force in (x/y)=(0/0): 0.000 [kN]  
 resulting compression force in (x/y)=(0/0): 0.000 [kN]


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	Load [kN]	Capacity [kN]	Utilization $\beta_N$ [%]	Status
Steel Strength*	N/A	N/A	N/A	N/A
Pullout Strength*	N/A	N/A	N/A	N/A
Brick breakout**	N/A	N/A	N/A	N/A
Pullout of one brick**	N/A	N/A	N/A	N/A

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

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#### 4 Shear load (ETAG 029 Annex C, Section C.5.2.2)

	Load [kN]	Capacity [kN]	Utilization $\beta_v$ [%]	Status
Steel Strength (without lever arm)*	0.799	12.821	7	OK
Steel failure (with lever arm)*	N/A	N/A	N/A	N/A
Local brick failure**	1.598	1.000	160	not recommended
Brick edge failure in direction x+**	0.811	31.384	3	OK
Pushing out of one brick in direction x+**	0.160	8.190	2	OK

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

##### 4.1 Steel Strength (without lever arm)

$V_{Rk,s}$ [kN]	$\gamma_{M,s}$	$V_{Rd,s}$ [kN]	$V_{Sd}$ [kN]
20.000	1.560	12.821	0.799

##### 4.2 Local brick failure

$s_{  }$ [mm]	$s_{\perp}$ [mm]	$s_{cr,  }$ [mm]	$s_{cr,\perp}$ [mm]	$c$ [mm]	$c_{cr}$ [mm]
50	0	250	120	725	115

$\alpha_{g,v}$	$\alpha_j$	$V_{Rk,b}$ [kN]	$\gamma_{M,m}$	$V_{Rd,b}$ [kN]	$V_{Sd}$ [kN]
1.000	1.000	2.500	2.500	1.000	1.598

##### 4.3 Brick edge failure in direction x+

$k$	$d_{nom}$ [mm]	$h_{ef}$ [mm]	$f_{b,v}$ [N/mm <sup>2</sup> ]	$c_1$ [mm]
0.42	10	75	4.00	725

$V_{Rk,c}$ [kN]	$\alpha_{g,v}$	$\gamma_{M,m}$	$V_{Rd,c}$ [kN]	$V_{Sd}$ [kN]
78.459	1.000	2.500	31.384	0.811

##### 4.4 Pushing out of one brick in direction x+

$A_{act}^H$ [mm <sup>2</sup> ]	$f_{vko}$ [N/mm <sup>2</sup> ]	$\sigma_d$ [N/mm <sup>2</sup> ]
273,000	0.15	0.00

$V_{Rk,pb}$ [kN]	$\gamma_{M,m}$	$V_{Rd,pb}$ [kN]	$V_{Sd}$ [kN]
20.475	2.500	8.190	0.160

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## 5 Warnings

- The anchor design methods in PROFIS Anchor require rigid anchor plates per current regulations (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 Anchor calculates the minimum required anchor plate thickness with FEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid base plate assumption is valid is not carried out by PROFIS Anchor. Input data and results must be checked for agreement with the existing conditions and for plausibility!
- Only the local load transfer from the anchor(s) to the wall is considered, a further load transfer in the wall is not covered by PROFIS!
- Wall is assumed as being perfectly aligned vertically – checking required(!): Noncompliance can lead to significantly different distribution of forces and higher tension loads than those calculated by PROFIS. Masonry wall must not have any damages (neither visible nor not visible)! While installation, the positioning of the anchors needs to be maintained as in the design phase i.e. either relative to the brick or relative to the mortar joints.
- The effect of the joints on the compressive stress distribution on the plate / bricks was not taken into consideration.
- If no significant resistance is felt over the entire depth of the hole when drilling (e.g. in unfilled butt joints), the anchor should not be set at this position or the area should be assessed and reinforced. Hilti recommends the anchoring in masonry always with sieve sleeve. Anchors can only be installed without sieve sleeves in solid bricks when it is guaranteed that it has not any hole or void.
- The accessories and installation remarks listed on this report are 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 compliance with current standards (e.g. ETAG 029) is the responsibility of the user.
- The Young's modulus of the wall  $E_{wall}$  (not plastered!) is determined in accordance to EN 1996-1-1:2012
- Drilling method (hammer, rotary) to be in accordance with the approval!
- Masonry needs to be built in a regular way in accordance with state-of the art guidelines!
- Please note that, for ETA approved masonry units, the resistance and parameters are only valid for that particular brick (hollow/solid) or for bricks of the same base material with larger size and larger compressive strength (solid), according to ETAG 029.

## Fastening does not meet the design criteria!

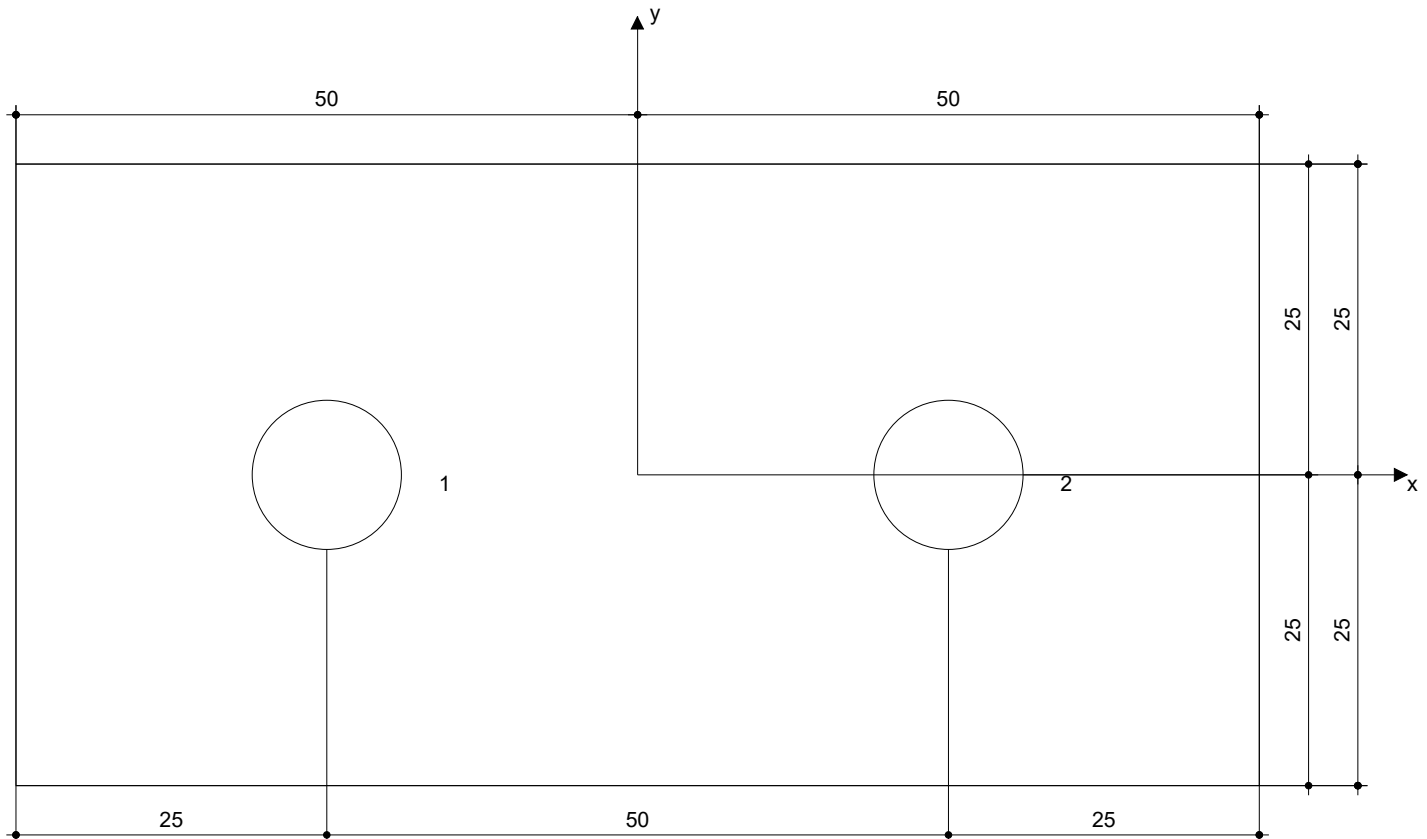
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## 6 Installation data

Anchor plate, steel: -  
 Profile: no profile  
 Hole diameter in the fixture:  $d_f = 12 \text{ mm}$   
 Plate thickness (input): 5 mm  
 Recommended plate thickness: not calculated  
 Drilling method: Hammer drilled  
 Cleaning: compressed air

Anchor type and diameter: HIT-HY 270 + HIT-V-R M10  
 Installation torque: 0.008 kNm  
 Hole diameter in the base material: 12 mm  
 Hole depth in the base material: 75 mm  
 Minimum thickness of the base material: 105 mm



### Coordinates Anchor mm

Anchor	x	y	C <sub>-x</sub>	C <sub>+x</sub>	C <sub>-y</sub>	C <sub>+y</sub>
1	-25	0	725	775	250	300
2	25	0	775	725	250	300

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## 7 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.
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