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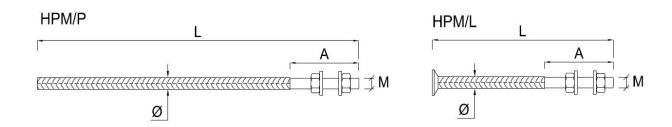
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## Assignment Evaluation of area of usage for Peikko HPM P anchor bolts

The HPKM column shoes serve as connectors between a precast concrete column and foundation or between two columns. The HPKM column shoes are fixed with nuts and washers to anchor bolts which have previously been concreted to the lower structure (column or foundation).

## **Anchor bolt types**

Peikko HPM anchor bolts are of two types HPM P and HPM L. These bolts are made of hot-rolled ribbed bars with nominal yield strength of  $f_{yk} = 500$  MPa (B500B, EN 10080). The bolts are specified in detail in Fig. 1.



Туре	Thread	Thread length	Stress area of the thread	Ribbed bar diam.	Washer	НРМ Р		HPM L	
	М	Α	$A_{sp}$	Ø		L 1)	weight	L	weight
	mm	mm	mm <sup>2</sup>	mm		mm	kg	mm	kg
HPM 16	16	140	157	16	Ø38-6	810	1,7	280	0,9
HPM 20	20	140	245	20	Ø46-6	1000	2,9	350	1,4
HPM 24	24	170	352	25	Ø56-6	1160	4,9	430	2,2
HPM 30	30	190	561	32	Ø65-8	1420	9,8	500	4,1
HPM 39	39	200	976	40	Ø90-10	2000	21,8	700	9,2

<sup>1)</sup> The length of the HPM P bolts can be calculated according to EN 1992-1-1 by using applied concrete strength.

Fig. 1. Peikko anchor bolts to be used with column shoes.



The threads of both bolts are equal. The only difference between the bolts is the way to anchor the ribbed bar into concrete. In this respect HPM P is a straight bar, HPM L is a bar with a headed stud.

HPM L anchor bolts have a European Technical Approval (ETA-02/0006). The characteristic resistances of the HPM L bolts are given in ETA. Design calculations can be performed according to ETAG 001. Straight bars (HPM P) shall be anchored according to EN 1992-1-1. The length necessary for developing the required tensile force in an anchorage has been pre-calculated. Both anchor bolts (HPM P with straight bar and HPM L with headed stud) can transmit the same force. They have equal design resistances.

In the initial type tests of Peikko HPKM column shoes all anchor bolts were HPM P types. The tests were performed according to CUAP 03.02/06. All tests passed.

Conclusion

HPM P anchor bolts have substantially the same characteristics as HPM L anchor bolts that the works in which they are installed satisfy the Essential Requirements (CPD Art. 2.1) and are fit for their intended use.

Espoo, 12.6.2014

Lasse Mörönen

Product Manager

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