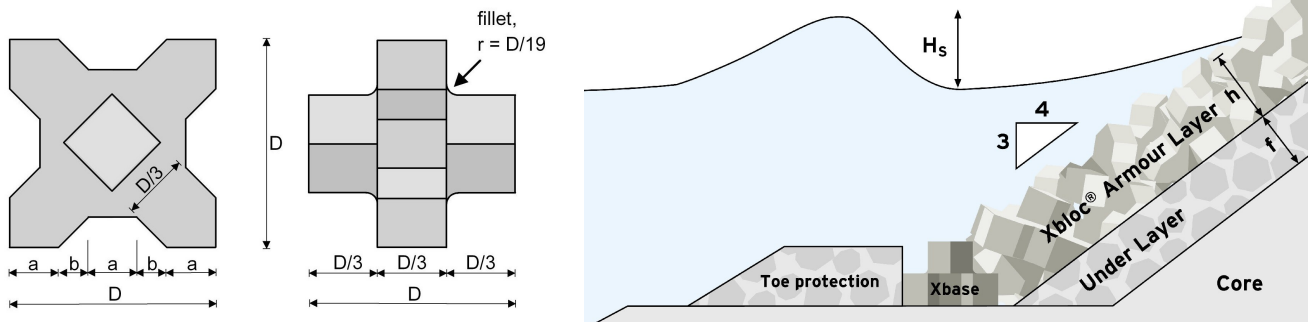


# Guidelines for design using Xbloc® armour units

Below information can be used for the preparation of a concept design. DMC is pleased to make a concept design for Xbloc® armoured slopes. Please return the client data sheet [to be downloaded from [www.xbloc.com](http://www.xbloc.com)] or contact us directly for a preliminary design – without any obligations.



Xbloc® unit height

$$D \geq \frac{H_s}{1.92\Delta} \quad \text{with} \quad \Delta = \left[ \frac{\rho_{concrete}}{\rho_{seawater}} - 1 \right]$$

Xbloc® unit weight

$$W_{xbloc} = \rho_{concrete} \frac{D^3}{3} = \rho_{concrete} V_{xbloc}$$

Filter layer weight

$$W_{filter} = \frac{W_{xbloc}}{15} \text{ to } \frac{W_{xbloc}}{7}$$

Equations and design table are based on:

Slope: 3V : 4H  
 $\rho_{concrete}$ : 2400 kg/m<sup>3</sup>  
 $\rho_{seawater}$ : 1030 kg/m<sup>3</sup>  
 $K_d$ : 16 for trunk section  
 13 for head section [armour units are 25% heavier than for trunk section]

Unit volume $V_{xbloc}$ [m <sup>3</sup> ]	Design wave height $H_s$ [m]	Unit height D [m]	Unit weight $W_{xbloc}$ [ton]	Thickness Xbloc® armour layer h [m]	Density [number of blocks per 100 m <sup>2</sup> ]	Concrete volume per m <sup>2</sup> [m <sup>3</sup> /m <sup>2</sup> ]	Advised placement grid		Porosity Xbloc® armour layer [%]	Standard rock grading for filter layer [ton-ton]	Thickness filter layer [m]
0.75	3.35	1.31	1.8	1.3	70.00	0.53	1.70	0.84	59	0.06-0.3	0.8
1.0	3.69	1.44	2.4	1.4	57.78	0.58	1.87	0.92	59	0.06-0.3	0.8
1.5	4.22	1.65	3.6	1.6	44.10	0.66	2.15	1.06	59	0.3-1.0	1.3
2.0	4.65	1.82	4.8	1.8	36.40	0.73	2.37	1.16	59	0.3-1.0	1.3
2.5	5.01	1.96	6.0	1.9	31.37	0.78	2.55	1.25	59	0.3-1.0	1.3
3.0	5.32	2.08	7.2	2.0	27.78	0.83	2.70	1.33	59	0.3-1.0	1.3
4.0	5.86	2.29	9.6	2.2	22.93	0.92	2.98	1.47	59	0.3-1.0	1.3
5.0	6.31	2.47	12.0	2.4	19.76	0.99	3.21	1.58	59	1.0-3.0	1.8
6.0	6.70	2.62	14.4	2.5	16.71	1.00	3.48	1.72	61	1.0-3.0	1.8
7.0	7.06	2.76	16.8	2.7	15.08	1.06	3.67	1.81	61	1.0-3.0	1.8
8.0	7.38	2.88	19.2	2.8	13.80	1.10	3.83	1.89	61	1.0-3.0	1.8
9.0	7.67	3.00	21.6	2.9	12.75	1.15	3.99	1.97	61	1.0-3.0	1.8
10.0	7.95	3.11	24.0	3.0	11.89	1.19	4.14	2.04	61	1.0-3.0	1.8
12.0	8.44	3.30	28.8	3.2	10.53	1.26	4.39	2.16	61	1.0-3.0	1.8
14.0	8.89	3.48	33.6	3.4	9.08	1.27	4.73	2.33	63	3.0-6.0	2.4
16.0	9.29	3.63	38.4	3.5	8.31	1.33	4.94	2.43	63	3.0-6.0	2.4
18.0	9.67	3.78	43.2	3.7	7.68	1.38	5.14	2.53	63	3.0-6.0	2.4
20.0	10.01	3.91	48.0	3.8	7.16	1.43	5.32	2.62	63	3.0-6.0	2.4



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