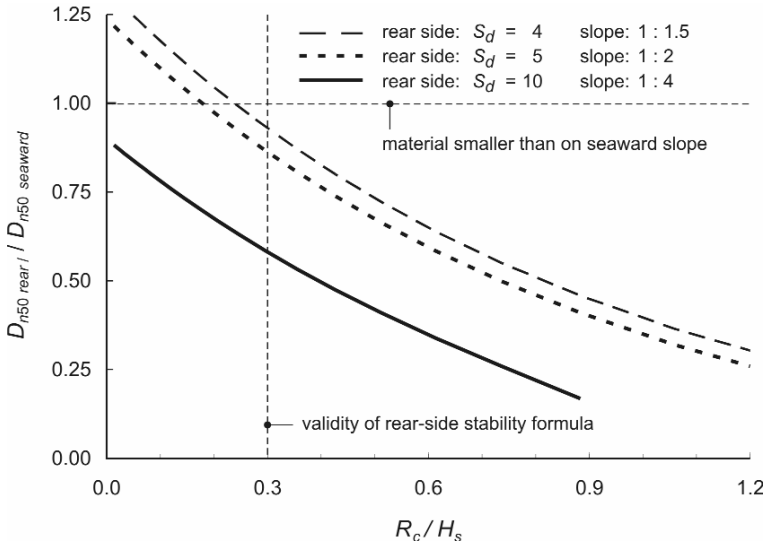
Ranges of validity

The range of conditions for the various parameters included in Equation 5.194 is summarised in Table 5.48. In the model tests on which this expression is based, the relative buoyant density, Δ (-), has not been varied, ie $\Delta = 1.65$.

Table 5.48 *Ranges of validity of parameters in Equation 5.194*

Parameter	Range
Fictitious wave steepness at toe: $s_{s\text{-}1,0} = 2\pi H_s/(gT_{m\text{-}1,0}^2)$	0.019–0.036
Number of waves, N	< 4000
Relative freeboard at the seaward side, R_c/H_s	0.3–2.0
Relative freeboard at the rear side, $R_{c,rear}/H_s$	0.3–6.0
Relative crest width, B/H_s	1.3–1.6
Relative crest level with respect to run-up level, $(R_{u1\%}\text{-}R_c)/(\gamma H_s)$	0–1.4
Stability number, $H_s/(\Delta D_{n50})$	5.5–8.5
Rear-side slope, (V:H)	1:4–1:2
Damage level parameter, S_d	2–3.0

Figure 5.80 shows the reduction in size of armourstone at the rear-side of the structure compared with that at the seaward side. In this graph the material at the seaward side is calculated based on the formula described in Box 5.16 in Section 5.2.2.2. Values of the damage level parameter, S_d , for different slopes correspond to *intermediate damage*. Figure 5.80 shows that for relatively high crest elevations the required size of armourstone at the rear side is smaller; this reduction is higher for more gentle slopes at the rear side. Figure 5.80 shows a curve for a slope of 1:1.5 although this is not within the range of validity of the formula; nevertheless, this curve shows that the formula provides relatively small differences compared with slopes of 1:2.



Notes

1 This figure is for **one particular structure type** (rubble mound with **permeable core**) and for a fictitious wave steepness of $s_{m\text{-}1,0} = 0.03$; other wave conditions or structure geometries result in different curves.

2 This figure is based on best estimates without taking uncertainty into account.

Figure 5.80 *Reduction in armourstone size at the rear side compared with armourstone size at the seaward side*