1 2 3 4 5 6 7 8 9 10

- The principles of the **shear concept** are discussed in Section 5.2.1.3, based on the well-known Shields shear-type stability parameter introduced in Section 5.2.1.2. Some specific applications (eg Pilarczyk's formula) are discussed in Section 5.2.3. The method of critical shear is also applicable to oscillatory flow (waves only), as well as to a combination of currents and waves (see Section 5.2.1.3).
- The **critical or permissible velocity method** is discussed in Section 5.2.1.4, based on the well-known Izbash velocity-type stability parameter introduced in Section 5.2.1.2. Some specific applications are shown in Section 5.2.3.
- The use of the $H/(\Delta D)$ **wave stability criterion** is introduced in Section 5.2.1.5 and discussed for different applications in Section 5.2.2.
- The use of the $H/(\Delta D)$ parameter to define a stability criterion in terms of a **head difference or height of overtopping** across dams is introduced in Section 5.2.1.6 and discussed in Section 5.2.3.
- In Section 5.2.1.7 the **critical discharge method** is introduced.

The relationships used to transfer some stability parameters into others are described in Section 5.2.1.8. Finally, Section 5.2.1.9 gives an overview of the general design formulae.

5.2.1.2 *Governing parameters to evaluate stability*

Some of the parameters used to evaluate the hydraulic stability of rock structures consist of combinations of hydraulic (loading) parameters and material (resistance) parameters. The parameters that are relevant for the structural stability, can be divided into four categories, discussed below:

- wave and current attack
- characterisation of armourstone
- cross-section of the structure
- response of the structure.

Wave attack

In the case of wave attack on a sloping structure the most important parameter, which gives a relationship (see Equation 5.95) between the structure and the wave conditions, is the **stability number**, N_s (-):

$$N_s = \frac{H}{\Delta D} \tag{5.95}$$

where:

H	=	wave height (m). This is usually the significant wave height, H_s, either defined by the average of the highest one third of the waves in a record, $H_{1/3}$, or by $4\sqrt{m_0}$, the spectral significant wave height H_{m0} (see Section 4.2.4). For deep water both definitions give more or less the same wave height. For shallow-water conditions there may be substantial differences up to $H_{1/3} = 1.3\ H_{m0}$ (see Section 4.2.4)
Δ	=	relative buoyant density (-), described by Equation 5.96 (see also Section 3.3.3.2)
D	=	characteristic size or diameter (m), depending on the type of structure (see Section 5.2.2.1). The diameter used for armourstone is the median nominal diameter, D_{n50} (m), defined as the median equivalent cube size (see Section 3.4.2). For concrete armour units the diameter used is D_n (m), which depends on the block shape (see Section 3.12).