

GLOSSARY OF TERMS AND SYMBOLS

GLOSSARY OF TERMS

Armour layer. The outermost protective layer of a rubble mound structure composed of armour units which are either quarry rock or specially shaped concrete units.

Bermstones. The protective layer laid in front of the toe of the structure to prevent scouring of foundation material due to waves and currents.

Surf similarity parameter. Being defined as the ratio of tangent of slope angle to the square root of wave steepness, it has often been used to describe the form of wave breaking and to predict wave runup on a sloping beach or structure.

Breakwater head. The end of a breakwater which is more vulnerable to wave attack at all directions. The design of which requires special attention and a more robust structure is required.

Breakwater trunk. The body of the breakwater other than the structure head.

Coping. The uppermost in situ concrete portion of a vertical seawall. It is constructed in the late stage of the construction programme for minimizing the effects of wall settlement upon completion.

Core. The innermost material of a rubble mound breakwater, the permeability of which determines the extent of wave transmission to the leeward side of the breakwater due to long period wave. The more porous is the core material, the higher will be the degree of wave transmission.

Filter. Intermediate layer to prevent fine materials of an underlayer from being washed through the voids of an upper layer.

Freeboard. The height of a structure above still water level.

Longshore sediment transport. The sediment that is transported in the alongshore direction in the nearshore zone by waves and currents.

Overtopping. Water passing over the top of the seawall.

Plunging waves. A kind of breaking waves which occur on mildly to steeply sloping

beaches or structures and are characterized by the crest of the wave curling over forward and impinging onto part of the wave trough. The wave itself is spectacular when air escapes by bursting through the back of the wave or by blowing out at a nonbreaking section of wave crest.

Still water level. Water level which would exist in the absence of waves.

Surging waves. A kind of breaking waves which occur on very steeply sloping beaches or structures and are characterized by narrow or nonexistent surf zones and high reflection.

Run-up. The rush of water up a structure as a result of wave action.

Toe of structure. The base of the structure on its seaward face.

Underlayer. A granular layer between the armour layer and the core material, and functions as separation and filter. It also provides a foundation for placement of armour layer.

Volumetric porosity. The ratio of void volume to total volume.

Wave steepness. A ratio of the wave height to the wavelength. The limiting wave steepness in deep water is about 0.142 which occurs when the water particle velocity at the wave crest just equals the wave celerity. A further increase in steepness would result in particle velocities at the wave crest greater than the wave celerity and breaking starts to occur.

Wave wall. A structure built on the seawall or breakwater to reduce wave overtopping.

GLOSSARY OF SYMBOLS

A	Erosion area in a cross-section
B	Crest width
C_r	Wave reflection coefficient
C_t	Wave transmission coefficient
D	Nominal size of an equivalent cube
D_{15}	15% of the material passing through that size
D_{50}	50% of the material passing through that size
D_{85}	85% of the material passing through that size
d	Water depth
E_i	Incident wave energy
E_r	Reflected wave energy
E_t	Transmitted wave energy
g	Acceleration due to gravity
H	Wave height
$H_{1/3}$	Significant wave height, also denoted as H_s in other literatures
H_i	Incident wave height
H_{max}	Maximum wave height
H_o'	Equivalent deepwater significant wave height
H_r	Reflected wave height
H_{total}	Total wave height
K_D	Dimensionless stability coefficient in Hudson's formula
k_Δ	Layer thickness coefficient
L	Wavelength
L_o	Deepwater wavelength
N	Number of waves
N_a	Average number of armour units per unit area

N_o	Number of waves during a peak of storm events
n	Number of armour layers or number of rock layers
P	Notional permeability factor
p	Volumetric porosity
Q	Mean overtopping discharge rate per meter run of structure
R_c	Freeboard between still water level and crest of structure
$R_{u2\%}$	The run-up level exceeded by 2% of the incident waves
R_{ui}	The run-up at i % exceedance level.
r	Roughness coefficient
S	Damaged level
s	Slope of seabed
s_m	Offshore wave steepness based on mean wave period
s_p	Offshore wave steepness based on peak wave period
T	Wave period
$T_{1/3}$	Significant wave period, also denoted as T_s in other literatures
T_m	Mean wave period
t_a	Thickness of armour layer
t_u	Thickness of underlayer
W_a	Weight of an armour unit
W	Weight of a rock in the underlayer
α	Slope angle of structure
β	Incident wave angle relative to normal of structure
γ_a	Unit weight of armour unit
γ_r	Unit weight of rock
γ_w	Unit weight of water
ξ_c	Critical surf similarity parameter for transition from plunging to surging waves
ξ_m	Surf similarity parameter based on mean wave period

ξ_p	Surf similarity parameter based on peak wave period
ρ, ρ_w	Mass density of seawater
ρ_r	Mass density of rock
Δ	Relative mass density e.g. for rock $\Delta = (\text{mass density of rock}/\text{mass density of water}) - 1$

