

GLOSSARY

TERMS

Active earth pressure: Minimum horizontal pressure condition which develops when a wall rotates about its base and away from the backfill 0.001 to 0.003 radian (see paragraphs 3-4a and 3-5, and Figure 3-1).

At-rest earth pressure: Lateral pressure condition when no wall movement occurs (see paragraphs 3-4c, 3-7, 3-10, and Figure 3-1).

Bond breaker: A coating or sheet of a substance that does not adhere to concrete, placed on one monolith in the area where concrete will be placed later, to maintain separate movement of the two monoliths.

Breaking wave: See "waves."

Broken wave: See "waves."

Buttress: A vertical fin, turned perpendicular to the stem, placed monolithic with the stem and heel so as to brace the stem into a series of wall slabs supported at the base and the buttresses.

c: Symbol for cohesion value (see paragraph 3-5 and Figure 3-8).

Coastal flood wall: A flood wall that is resisting the effects of the surge tide and waves accompanying a storm. See paragraphs 4-1a and 7-1.

Closed-face structure (Chapter 10): A prefabricated facing system for an alternative type of retaining wall, where the facing has no openings. The joints between precast panels will form a pattern but vegetation cannot grow through them. See open-face structure.

Counterfort: Like a buttress, except located over the toe instead of over the heel. The fin is in tension instead of the compression of the buttress.

Diffraction (of waves): The effect of bending of the direction of propagation (travel) of a wave crest as it passes by the end of a jetty or through an opening. Thus the wave pattern spreads outward into the sheltered region within the barrier's geometric shadow.

Drained phi value: Phi value of a soil, as determined by an S test.

Drained soil tests: Tests in which the confining and shear stresses are applied so slowly that pore water pressure does not build up. An increase in applied stress produces an equal increase in effective stress.

Driving force: A force acting to move the wall, usually caused by earth and water beyond the end of the heel. See paragraph 3-7.

Driving wedge: A wedge of soil which produces a horizontal force (a driving force) tending to cause instability of a wall. See paragraph 3-7.

Fetch: The area of water in which waves are generated by a wind having a fairly constant direction and speed. Sometimes used synonymously with "fetch length," the horizontal distance over which a wind generates waves.

Frequency of a wave: See "waves."

Heel: The heel of a wall is the base slab projection pointing toward the net driving force.

Kern: The portion of the area under the base such that when the resultant normal force ("N'" or "V" in the figures in this manual) is inside the kern, the entire base is in compression contact with the subgrade. When the resultant normal force is located outside the kern, some portion of the base will be tending to lift off of the subgrade instead of being in compression contact. For a rectangular base, the edges of the kern will lie at the one-third points of the base width, as shown in Figure 4-4.

Nonbreaking wave: See "waves."

Open-faced structure (Chapter 10): A prefabricated facing system for an alternative type of retaining wall, where the precast facing units have openings between or through them. Vegetation, usually evergreen, is then planted so as to grow through the openings and present a more natural appearance of the wall's exposed face.

Phi: Angle of internal friction of earth (see Figure 3-1).

Passive earth pressure: Pressure condition that develops when a wall is moved toward backfill, causing horizontal stresses to increase and shear stresses to reverse direction (see paragraphs 3-4b and 3-5).

Protected side (of a flood wall or seawall): The side facing the area protected from flooding.

Q test (of soil): Also known as an unconsolidated undrained or UU test. Both the confining and shearing stresses are applied so rapidly that the neutral stress supports all the added load, and there is no change in water content.

R test (of soil): Also known as a consolidated undrained or CU test. The confining stresses are applied to the soil so slowly that the neutral stress is not changed and the soil consolidates fully. The shear stress, however, is applied so quickly that the neutral stress carries all this change, and there is no further consolidation or change in water content.

Refraction (of a wave): The process by which the direction of movement is changed for a wave moving in shallow water at an angle to the underwater contours: the part of the wave advancing in shallower water moves more slowly

than that part still advancing in deeper water, causing the wave crest to bend toward alignment with the underwater contours.

Resisting force: A force tending to resist movement of a wall. See paragraph 3-8.

Resisting wedge: A wedge of soil which produces a lateral reaction (a resisting force) which tends to resist instability of a wall. See paragraph 3-8.

S test (of soil): Also known as a consolidated drained or CD test. The confining stresses are applied so slowly that the neutral stress does not change. The soil consolidates with no change in neutral stress.

Seawall: See paragraph 1-4a, especially the comparison with a coastal flood wall. A seawall is usually a gravity structure for the purpose of protecting the area behind it from the action of tide and waves in front of it, sometimes with a face shaped to dissipate wave energy.

Shoaling: Point at which the water depth gets more shallow as the wave crest approaches the shoreline or a wall.

Stem: The vertical wall portion of a cantilever inverted-T wall.

Surge stillwater level: A rise above normal water level on the open coast due to the action of wind stress on the water surface. Surges resulting from hurricanes also include the rise in level due to atmospheric pressure reduction.

Structural wedge: The structural wedge consists of the structure itself with any soil and water contained within the boundaries of the structure or over the base.

Toe: The toe of a wall is the portion of the base slab pointing toward the net resisting force.

Train, wave: See "waves."

Undrained soil tests: Tests where the pore water pressure is not allowed to dissipate and the water carries all of the applied stresses.

Unprotected side of a flood wall or seawall: The side of the wall facing the storm tide and waves, or rising water.

Wall friction: The angle of friction between a soil mass tending to move parallel along the interface between the soil mass and a wall. See paragraph 3-14.

Water stop: A strip of material, cast into each of two adjacent concrete monoliths and spanning the space between them, for the purpose of preventing the flow of water through the space. Usually made of elastomeric material for

civil works structures, but also made of sheet metal. See paragraph 7-13 and Figure 7-9.

Wave parameter definitions (see paragraph 3-24) are best obtained from Chapter 7 of the Shore Protection Manual (U. S. Army Engineer Waterways Experiment Station 1984).^{*} Abbreviated definitions are shown below.

Breaking wave: While there are several types of breaking waves, the type associated with the high-impulse effects used in this manual is the plunging breaker, where the wave crest becomes more and more steep, until the crest curls forward and falls over a pocket of trapped air. This is characterized by a very large dynamic impulse of short (0.2 second, approximately) duration and a rise in hydrostatic pressure from still water (no wave) up to the crest one-half of the wave height above still water. See paragraph 3-24d.

Broken wave: A somewhat confused mass of water surging forward after the wave has broken some distance away from the wall. See paragraph 3-24e.

Nonbreaking wave: A wave impacting on a wall under conditions where there is no breaking tendency but the mass of water is stopped from forward motion by the wall and imparts its energy to the vertical face. See paragraph 3-24c.

Wave height: The vertical distance from the crest of a wave to the adjacent trough (lowest elevation). A continuously changing value in a typical train of waves, frequently assumed to have a Gaussian distribution. See paragraph 3-24b for the assumed values as fractions of the significant wave height (an average of the highest one-third of all of the waves in the wave train is assumed for design of the structure).

Wave length: The horizontal distance from one wave crest to the next crest in the group (train) of waves. A continuously changing value in a typical train of waves, frequently assumed to have a Gaussian distribution.

Wave steepness: The ratio of wave height to wave length.

Wave train: A group of waves coming from the same direction over the same fetch.

Wave frequency: The number of wave crests passing a given point in one second, the reciprocal of the wave period.

Wave period: The time in seconds required for a wave crest to travel a distance of one wave length, the reciprocal of the frequency.

^{*} References cited in this appendix may be found in Appendix A, "References."