# CREATING A CRATER

There was an explosive volcanic eruption on the flanks of the Ko'olau Mountains about 300,000 years ago. During this eruption, large amounts of ash and fine particles were sent into the air. As these particles settled around the center of the eruption, a crater was created.

Diamond Head's highest point (761 feet) is on the seaward rim and reflects the windblown buildup of ash at the time of the eruption. Since their formation, the slopes of the crater have been eroded by rain, wind, and the pounding sea.

Tuff Cones

When the ash and fine particles settled, they were cemented into rock called tuff. Thus, Diamond Head is also a tuff cone. Other tuff cones on O'ahu from the same time period include Pūowaina (Punchbowl) and Koko Head.
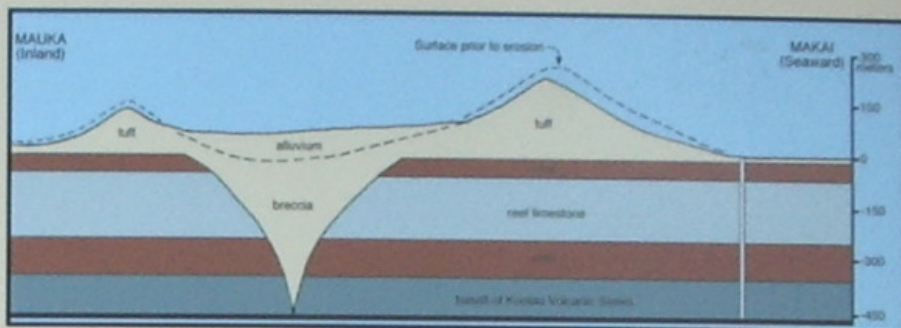
Cross-section of Diamond Head Crater showing the eruption of magma through the earlier layers of basalt and coral limestone. Later, the erosion of the interior slopes deposited a layer of alluvium on the crater floor.
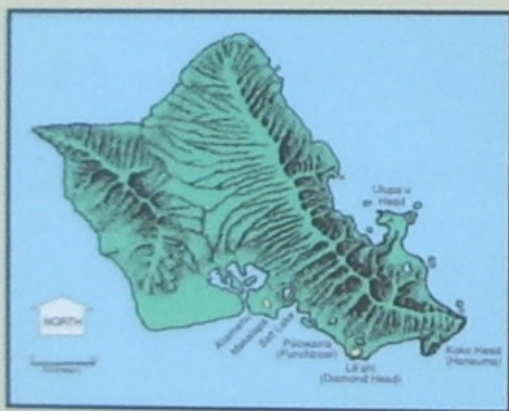
Major tuff cones of southeastern O'ahu.

Birth of a Volcanic Island

The creation of O'ahu began around 3 million years ago when 2 shield volcanoes erupted. The Wai'anae and Ko'olau Mountain Ranges are the very eroded remnants of these volcanoes.

Much later, about 500,000 years ago, eruptions began along the Ko'olau rift zone. It was during one phase of these eruptions that the tuff cones of O'ahu were formed. Can future eruptions occur on O'ahu? Geologists say it is possible!

Tuff is Not So Tough!

A coral reef now helps protect the seaward slopes of the crater. But intense storms, with heavy rains and runoff, continue to deepen the gullies on the slopes of the crater. An estimated 100 feet have been eroded from the summit.

The erosion of Diamond Head is hastened by the millions of feet that walk through the crater every year. Help us slow the erosion by staying on the marked trail.

The nearly round shape of Diamond Head crater suggests that it was formed during a single, brief volcanic eruption.