

## HOW THE CRATER WAS FORMED

The pronounced seaward summit, deeply eroded ridges, and ovoid-shaped crater are evidence of Lē'ahi's very dynamic geological history. The creation of O'ahu began around 2.5 to 3 million years ago with volcanic eruptions from 2 shield volcanoes. A period of extensive erosion followed, leaving the Ko'olau and Wai'anāe Mountain Ranges as the remnants of these very eroded volcanoes.

After about 2 million years of volcanic inactivity, the southeastern end of the Ko'olau Range erupted. These eruptions occurred near the ocean where the magma was broken down into ash and fine particles by the water and steam. Blown into the air, these particles were cemented together into a rock called tuff which created tuff cones, such as Lē'ahi.

Lē'ahi is believed to have been created about 300,000 years ago during a single, brief eruption. The broad, saucer-shaped crater covers 350 acres with its width being greater than its height. The southwestern rim is highest because winds were blowing ash in this direction during the eruption. Since the eruption, the slopes of the crater have been eroded and weathered by rain, wind, and the pounding of the sea. A coral reef now protects the seaward slopes of the crater.

Today, Lē'ahi (Diamond Head) is the most recognized landmark in Hawai'i. It was designated a National Natural Landmark in 1968 as an excellent example of a tuff cone.

## ENVIRONMENT

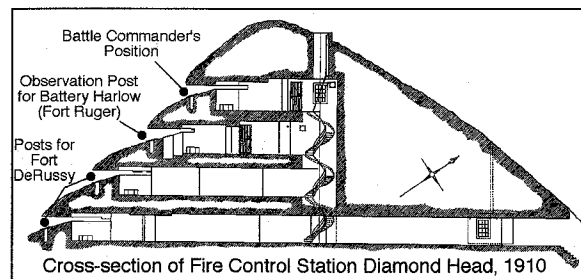
The semi-arid climate, the steep rocky slopes, and the shallow soil of Diamond Head support mostly low shrubs and herbs. Botanists believe that the crater was once covered by a dryland forest but today, there are only a few native Hawaiian species remaining. Until the early 1900s, rainwater collected on the crater floor creating a small lake frequented by native ducks, coots, and gallinules.

Most of the plants and animals you see in the crater today were introduced to Hawai'i since the 1800s. Dominant plants are the *kiawe*, a relative of the mesquite, and *koa haole*. Both of these plants were brought in as cattle feed and have adapted well to the hot, dry conditions. You may see some of the common introduced birds, such as cardinals, doves, and sparrows.

## THE EARLY HISTORY

It is said that Hi'iaka, sister of the fire goddess Pele, gave Lē'ahi its name because the summit resembles the forehead (*lae*) of the 'ahi fish. Another translation is fire headland and refers to the navigational fires that were lit at the summit to assist canoes travelling along the shoreline. The *heiau* (temple) built on the summit was dedicated to the god of wind as protection against strong updrafts that could put out these navigational fires. Today, the Diamond Head Light, built in 1917, provides a visual aid for navigation.

In the late 1700s, Western explorers and traders visited Lē'ahi and mistook the calcite crystals in the rocks on the slope of the crater for diamonds. Thus, the name Diamond Head came into common usage.



## MILITARY HISTORY

With its panoramic view from Koko Head to Wai'anāe, the summit of Diamond Head is an ideal site for the coastal defense of O'ahu. In 1904, Diamond Head was purchased by the Federal government and designated for military use. Fortification began in 1908 with the construction of gun emplacements and an entry tunnel through the north wall of the crater from Fort Ruger known as the Kapahulu Tunnel.

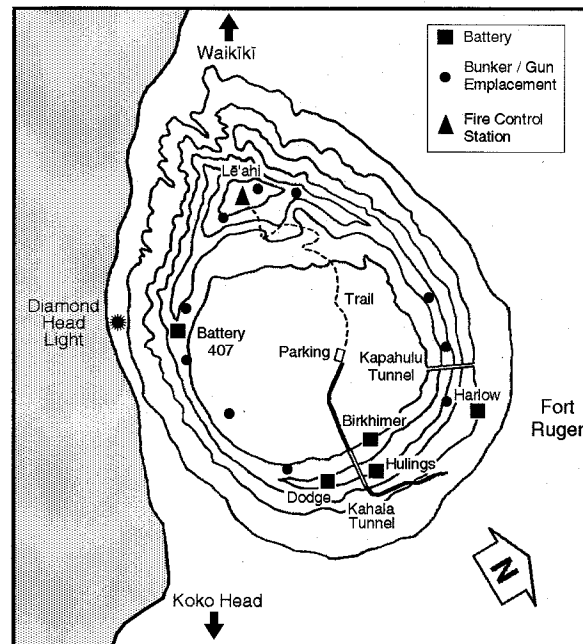
Batteries were built to house the coastal artillery. A total of 5 batteries were built at Diamond Head Crater: Harlow (1910) on the northern exterior, Dodge and Hulings (1913) which tunnel through the eastern crater wall, Birkhimer (1916) which is largely below ground inside the crater, and Battery 407 (1943) which tunnels through the southern wall.

Fire Control Station Diamond Head was built at the summit between 1908-1910 and housed instruments and plotting rooms to direct artillery fire from several batteries.

From this observation station, observers could triangulate targets and aim the mortar fire from Batteries Randolph and Dudley at Fort DeRussy in Waikiki and Battery Harlow at Fort Ruger on the outer slopes of the crater. Consisting of 4 levels, the exterior of the Fire Control Station was camouflaged with rubble embedded in concrete. Slits on each level provided seaward viewing for potential sea and air attacks. The 4 levels and the summit were accessed by a spiral staircase and ladders.

Additional coastal defense was provided by long range guns installed on the outer slopes and rim of the crater around 1915. Diamond Head was prepared to defend O'ahu from attack but no artillery was ever fired during a war.

The military features of Diamond Head are part of the Fort Ruger Historic District.

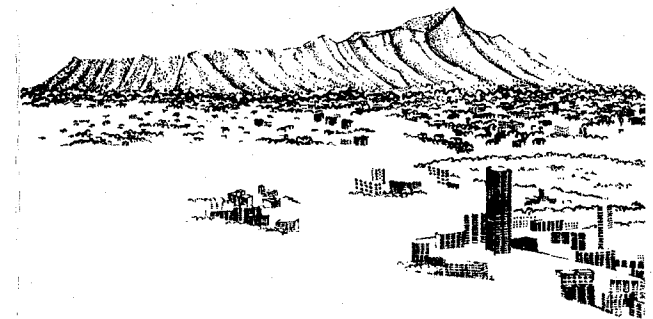


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STATE OF HAWAI'I

# DIAMOND HEAD (LĒ'AHĪ) STATE MONUMENT



HONOLULU, O'AHU



PROTECTING  
HAWAII'S FRAGILE  
ENVIRONMENT

## HISTORIC TRAIL TO THE SUMMIT

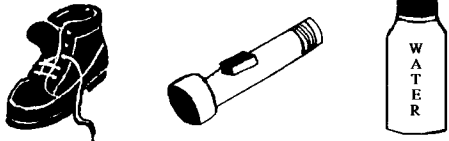
The trail to the summit of Lē'ahi was built in 1908 as part of the U.S. Army Coastal Artillery defense system. Entering the crater from Fort Ruger, through the Kapahulu Tunnel, the trail scaled the steep interior western slopes of the crater to the summit. The dirt trail with numerous switchbacks was designed for mule and foot traffic. The mules hauled materials on this trail for the construction of Fire Control Station Diamond Head located at the summit. Other materials were hoisted from the crater floor by a winch and cable to a midway point along the trail. The Kahala Tunnel was built in the 1940s and is the public entrance to the crater.

## HIKING THE TRAIL

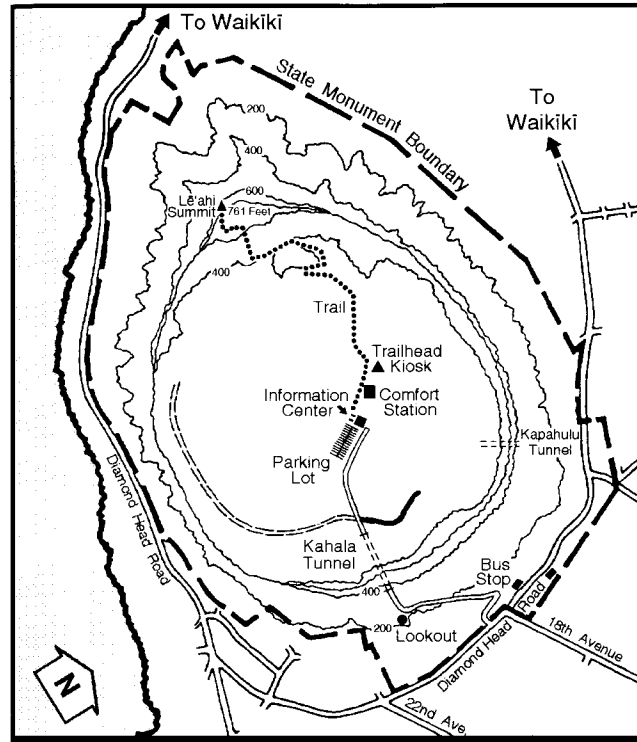
From the trailhead to the summit of Diamond Head Crater, you will cover 0.7 miles (1.1 km) one way and climb 560 feet (171 m) from the crater floor. The trail follows an uneven and steep terrain requiring caution and appropriate footwear. Portions of the trail involve steep stairways - take your time. Other portions of the trail go through long, dark tunnels - a flashlight is suggested. The weather here is always hot - a hat, sunscreen and plenty of water are recommended. Allow 1.5 to 2 hours for a safe and leisurely round-trip hike.

## HAVE A SAFE HIKE

• Are you prepared with these items:

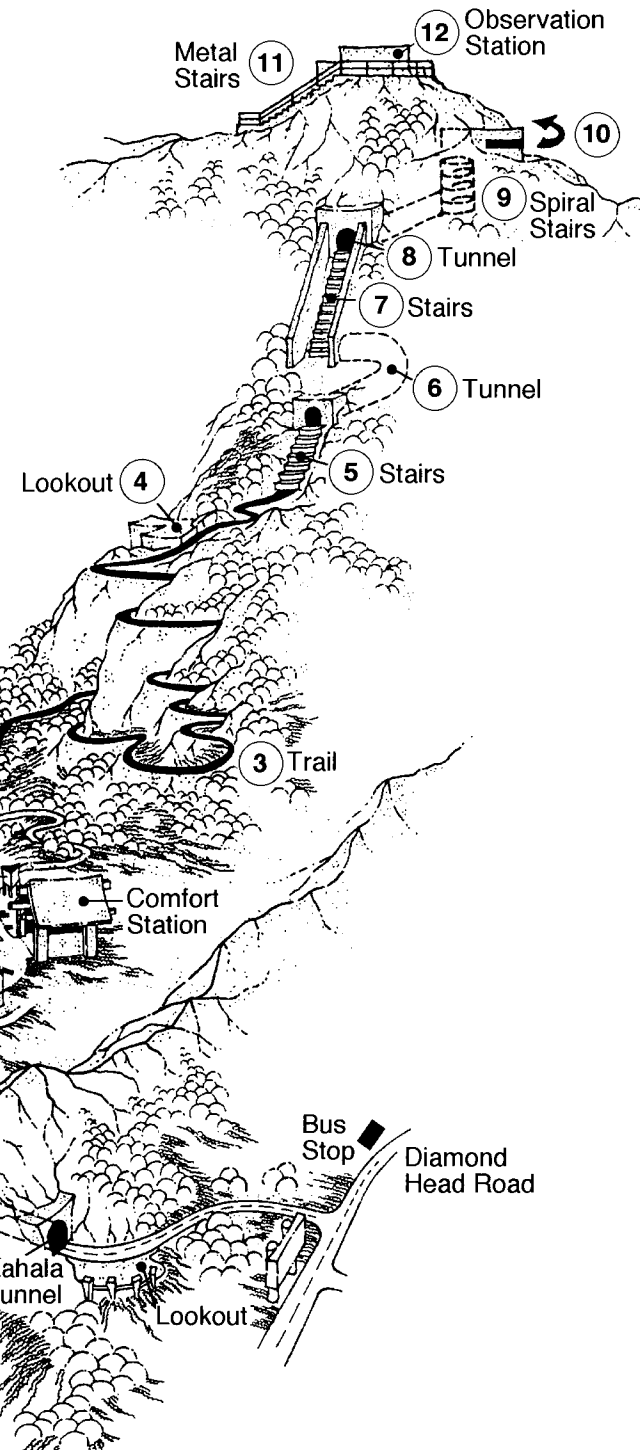


- Stay on the designated trail. Taking shortcuts adds to the erosion and falling rocks may create a hazard for other hikers.
- Do not enter unauthorized areas. There is a potential radiation hazard from the antennas.
- The tunnel gate closes at 6:00pm (1800 hours) and reopens at 6:00am. Keep track of the time and do not get locked in!
- Pack out what you pack in and do not litter.
- Do not deface the historic structures.



*Lē'ahi is a fragile resource. By staying on the trails and not taking shortcuts, you save plants and reduce erosion.*

*Mahalo*



## POINTS OF INTEREST ALONG THE TRAIL

- 1 The trailhead at the parking lot is on the crater floor. Elevation of 200 feet (61 m).
- 2 The concrete portion of the trail was recently installed to reduce trail erosion. The former pistol ranges are marked by earthen berms visible along the lower section of the trail.
- 3 The dirt trail conforms to the 1908 trail alignment and consists of numerous switchbacks up the steep interior slope.
- 4 Concrete Landing/Lookout. This foundation held a winch and cable to lift materials from the crater floor to a midway point on the trail.
- 5 Steep stairway of 74 concrete steps leading into the first tunnel.
- 6 Dark passage through a 225-foot long, narrow tunnel. Note the railing on the ceiling for cabling materials to the summit.
- 7 Second stairway consisting of 99 steep steps. The cross-beams above the stairway supported camouflaging.
- 8 At the top of the stairs is the entry to the lowest level of Fire Control Station Diamond Head which housed the observation equipment for Fort DeRussy at Waikiki.
- 9 This spiral staircase accessed the 4 levels of the Fire Control Station. Use your flashlight and go up to the third level where the mounts for the observation equipment are still present.
- 10 Exit to the exterior of the crater through slits once covered with metal shutters. Note the rock and concrete that camouflage the structure on the seaward side.
- 11 The metal stairs replaced the ladder to the summit in the 1970s for hiker safety.
- 12 The summit of the crater and the uppermost level of the Fire Control Station are at an elevation of 761 feet (232 m). Bunkers along the crater rim were built in 1915.