

Heart of USC&GS Warning System is This . . .



New Magnetic Observatory at Ewa

CONSTRUCTION is now in progress on a new magnetic observatory for the U. S. Coast and Geodetic Survey near Ewa. It will serve as the nerve center for magnetic observations and will be the heart of the seismic wave warning system in the Pacific area.

The modern observatory will be called the Honolulu Magnetic and Seismological Observatory, and is being constructed on a 175-acre tract of coral land about two miles west of the Pearl Harbor entrance channel.

Rear Admiral H. Arnold Karo, director of the Coast & Geodetic Survey, has set the end of this year for occupancy of the new observatory. It will replace the observatory at Barber's Point which has been experiencing magnetic disturbances caused by the nearby oil refinery and other rapidly developing commercial activities at the Campbell industrial park. A site had to be found which was free from such artificial disturbances and the anomalous effects of the lava mountains on the magnetic field. The Ewa beach area was chosen because it was the only remaining area available which fulfilled these requirements.

The contract for construction was awarded to Fisher Construction Co. on August 5, 1959, in the amount of \$340,744. The architectural and engineering services were provided by the firm of Rothwell and Lester, of Honolulu. The entire project is being administered by the District Public Works Officer, 14th U. S. Naval District, Pearl Harbor. Officer in Charge of the observatory is Lieutenant G. E. Haraden, USC&GS, who was most helpful in getting together the facts for this story.

The new magnetic center will include 4 houses situated north of the Ewa beach road for living quarters, office, laboratory, and workshop. The actual observatory buildings, comprising three seismological and four magnetic buildings, are being located in the tract's center, about a quarter-mile from the road.

Most buildings are one-story structures built of natural coral concrete blocks. The vault housing the delicate seismograph, which records earth tremors, will be made of heavily reinforced concrete.

The magnetic observatory buildings are to be constructed of completely non-magnetic and non-ferrous materials, according to Lt. Haraden. Vinyl tile is to be used on the floors because asphalt tile was found to be slightly magnetic. All nails and other metal fasteners will be of aluminum or some other non-magnetic material.

Limestone aggregate and medusa cement will be used in the concrete work on these buildings in order to comply with the restriction on non-magnetic materials. It is possible that some items of hardware may have to be specially fabricated for the same reason. Examples might be electrical switches and door locks, which normally contain steel springs as integral parts.

The magnetic variations observatory -- building 11 on the chart -- will be thermally insulated with one foot of foam glass to reduce temperature changes within the building. All buildings will be separated one from another because of the inter-action of the various instruments on each other.

Even the metal fire hydrants have been located a safe distance away from the buildings housing sensitive instruments. A rather extreme example of precautions taken to avoid artificial disturbances is the location of a sensitive pick-up unit which feeds information on tiny earth movements to the observatory. This unit is being placed high in the Waianae Mountains, about 8 miles from the observatory, and will be connected to the observatory recording device by short wave radio signals.

Located far from the man-made vibrations of the lower beach area, this instrument may give the first indication that a destructive seismic sea wave is in the making, possibly thousands of miles away, under the sea. The observatory administration building, equipped with teletype, emergency radio equipment, and direct telephone wires to the Honolulu area, is the heart of the warning system that covers more than three-quarters of the Pacific Ocean.

For the planes and ships that navigate the Pacific the observatory will furnish accurate information on the earth's magnetic field. It will tell the mariner or pilot how much his magnetic compass varies from true north and how much it will change each year. The Coast and Geodetic Survey not only obtains information on magnetism for the millions of nautical and aeronautical charts published each year but for the use of scientific research organizations, oil and metal prospectors, and short wave radio users. The accuracy of some of the guided missiles also depends on this information.