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ASCE Honors Machu Picchu and Tipon at Peruvian Embassy

By Mark Fitzgerald

In September ASCE designated two Incan sites in Peru—Machu Picchu and Tipon—international historic civil engineering landmarks. Perched on a ridge more than 1,500 feet above a bend in the Urubamba River in Southern Peru, Machu Picchu is believed to have been built at the height of the Incan empire in the 15th century. Often referred to as the lost city of the Incas, the site is comprised of various buildings, parks, terraces, and fountains, which are interconnected by numerous channels and a complex water-drainage system. Tipon is located approximately 23 kilometers southeast of Cusco and is known for its fine terraces and elaborate canals and aqueducts. The site, which also features Incan ceremonial buildings and living quarters, contains underground channels and above-ground irrigation systems that once supplied the whole area with water.

On March 8 representatives from ASCE, the National Museum of the American Indian, and the nation of Peru gathered at the Peruvian Embassy in Washington, D.C. to celebrate these landmark designations. “ASCE is extremely pleased to welcome these two marvels as historic landmarks from the Central and South American regions,” said ASCE’s president, William F. Marcuson III, Ph.D., P.E., Hon.M.ASCE, shortly before he presented the Ambassador of Peru, Felipe Ortiz de Zevallos, with a bronze plaque commemorating the landmark recognition. “Machu Picchu is a masterpiece of site selection, city planning, and design,” he went on to say. “Its infrastructure illustrates the

advanced civil, hydraulic, and geotechnical engineering capabilities of the Inca people. The steep agricultural terraces, fine masonry walls, surface and subsurface drainage, and the spring headworks are all excellent examples of Inca civil engineering."

Marcuson also highlighted the various civil engineering aspects of Tipon. "Tipon is a complex also attesting to the advanced hydraulic and geotechnical engineering of the Inca and their predecessors," he said. "Tipon is an engineering masterpiece of planning and construction. The complex irrigation system of canals, aqueduct, fountains, buried conduits, and a tunnel, some of which remain in use, provided conjunctive use of surface and spring water to these terraces constructed of massive, zoned earthworks and fine stone masonry walls."

Kenneth R. Wright, P.E., L.S., F.ASCE, the author of *Machu Picchu: A Civil Engineering Marvel* and *Tipon: Water Engineering Masterpiece of the Inca Empire* (both of which were published by ASCE Press), also spoke at the event. "The Incan people of 500 years ago were good civil engineers and they were very good hydrologists," he observed. "They knew how to handle and distribute water very well. Their foundations and buildings withstood the ravages of time, and their uncanny ability to support thatched roofs that were three-foot thick is still a marvel to modern architects and structural engineers. We can learn from their ability to protect steep slopes from erosion. We can learn from their water handling and urban drainage capabilities, and their ability to build for the ages. And perhaps, most of all, we can learn from their sensitive environmental design, which is certainly an example for all modern engineers."

Wright's work was instrumental in encouraging ASCE to designate these sites as international historic civil engineering landmarks. ASCE's Historic Civil Engineering Landmark Program recognizes historically significant civil engineering sites, structures, and projects throughout the world.