Abstract

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24 January 2018
ABSTRACT

Cape Spencer helipad and Eldred Rock helipad, built in the 1960s, served as the only landing sites to service their respective adjoining lighthouses and equipment in Juneau, Alaska. Eldred Rock and Cape Spencer experience extreme weather with 30 to 90 mph winds, seasonal temperatures ranging from -22°F to 90°F, and continuous sea spray. Both helipads were constructed out of wooden framing, with steel connections, and a concrete foundation supporting each wooden column. Eldred Rock, located 58 miles north of Juneau on a 3 acre island in Lynn Channel, consisted of a 70’ by 70’ octagon helipad structure that supported the U.S. Coast Guard, Marine Exchange, and the Federal Aviation Association (FAA) to maintenance efforts at the lighthouse and agency cameras. Multiple points of failure in the joists and beams were identified, as well as extreme sulfate exposure in the concrete foundations anchoring the wooden columns. Cape Spencer, located 58 miles west of Juneau on a ¾ acre island in the Pacific Ocean, had a 50’ by 50’ square helipad that General Communication Inc. (GCI), National Oceanic and Atmospheric Administration (NOAA), and AT&T used for maintenance of the island’s communication systems and lighthouse. Cape Spencer had a damaged wooden walkway, overstressed beams, rotted decking, broken safety rails, and corroded steel connections. As a result, CEU Juneau determined that these helipads were inadequate for service use and had requested viable remediation solutions. Concerns taken into consideration were that the remote locations were only accessible by helicopter or beach landing craft, and the material chosen had to be suitable to the weather conditions. This project included multiple designs for repair or replacement of both helipads in alignment with requirements outlined in the FAA Advisory Circular (AC150/5390-2C) and the Department of Defense’s (DOD) Unified Facilities Criteria (UFC 3-260-01), material selection (ex. composite wood, aluminum, or concrete), and a cost analysis.