



PROJECT PROFILE

Bridge of the Americas

Nondestructive Evaluation | Panama City, Panama



CLIENT

MCM GLOBAL, S.A.

BACKGROUND

The Bridge of the Americas connects the Americas across the Panama Canal on International Highway 1. Completed in 1962, the 5,427-foot long bridge features two approach spans and a central tied-arch span over the main canal waterway. It is supported on thirteen concrete piers and end abutments. The steel superstructure consists of two parallel, long-span trusses 42 to 139 feet in height. A nominal 7-inch-thick and 58-foot-wide concrete deck is supported on longitudinal stringers that, in turn, bear on floor beams. Suspended sections of the steel truss system are connected at six locations with a total of twenty-four steel transfer pins ranging in diameter from 9 to 19-5/8 inches.

The Ministerio de Obras Públicas of Panama awarded MCM a contract to replace the concrete deck of the Bridge of the Americas. Prior to the deck replacement, the Ministry required an evaluation of the bridge to determine the level of repairs that may be required for sections of the bridge that had not been maintained for over thirteen years. MCM retained WJE to perform the condition evaluation of the bridge using non-destructive techniques.



SOLUTION

WJE bridge engineers performed the visual inspection of the steel superstructure and reinforced concrete piers using industrial rope access techniques (climbing, rappelling, and ascending). Fracture-critical members and their connections were visually inspected at arm's length for evidence of cracking, corrosion and other indications of distress. The piers were sounded for delaminations. An assessment of the transfer pins included visual observation of pin surfaces and comprehensive non-destructive ultrasonic examination of inaccessible internal pin-hanger assemblies.



Areas within the bridge that exhibited distress or deterioration—primarily due to corrosion, fatigue cracking and initial concrete shrinkage—were examined in depth and the findings incorporated into the planned rehabilitation of the bridge.