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Fatigue evaluation of mast-arm system under simulated wind loads

This research focuses on the fatigue testing of a traffic mast-arm system for Kansas City Department of Public Works. The work includes the testing of a full scale stoplight, and summarization of the research results. The test plan is as follows: The stoplight will be tested under fatigue loads simulating wind loading; the mast and arm of spotlight system are connected together using a bolted connection. The stoplight will be fatigued for 10,000 cycles with new bolts, then 50,000 cycles with new bolts, then 100,000, and 500,000 cycles or failure in similar fashion. The fatigued bolts will then be evaluated using nondestructive testing (NDT). The NDT data will be used to investigate the crack propagations and effective area changes over the life cycle of the stoplight. Research summary will include design predictions and literature review of A325 bolts tested in fatigue. Tests results and NDT results will also be summarized. To date, the Testing setup has been constructed and few preliminary tests were conducted.