

CASE STUDY OF MITHI RIVER

BACKGROUND

Project Name: - Deflection test, Strain Test, Video Recording and submission of report for Bridge over Mithi River

Client: - Larsen & Toubro

Area: - Mumbai International Airport (Andheri E)

Month of Testing: – February 2016



INTRODUCTION

Twenty First SHM consultants pvt.ltd was awarded the contract by Larsen & Toubro Ltd. To carry out Instrumentation of N 1 taxiway inside Mumbai International Airport which leads to take off Runway 09/27 and lies to North of Runway. Various departing aircrafts use this Taxiway.

Mithi River crosses the Taxiway. Hence bridge across Mithi River has been constructed under AAI in year 2007.

Certain Cracks had developed in the girders beneath the Taxiway so deflection and Strain gauge tests were performed to find out the Deflection and strain on the object. Deflection was calculated by movement of linear potentiometers and strain was calculated by applying strain gauges to the object by a suitable adhesive, such as cyanoacrylate. As the object is deformed, the foil is deformed, causing its electrical resistance to change. This resistance change, usually measured using a Wheatstone bridge, is related to the strain by the quantity known as the *gauge factor*.

PROCEDURE – TESTS PERFORMED

- Initially induction & assembly of scaffolding materials was provided for access to site to drill holes and to investigate



Fig .1

- Octagonal holes were drilled according to drawing provided for detail investigation and crack mapping of the box girders



Fig . 2

- Crack mapping was performed to measure width and depth of the cracks using feeler gauge and Crack width measurement card.



Fig 3.1 – Crack width Measurement card



Fig 3.2 – Feeler Gauge

- Lots of cracks were observed inside the box girder and a detailed investigation was carried out.



Fig 4.1



Fig 4.2

- Linear potentiometers and strain gauges were mounted at various locations as provided in the drawing to carry out the deflection and strain test.



Fig 5.1 – Sensor inside Girder



Fig 5.2 – Linear Potentiometer

- CCTV cameras were mounted at a distance to record the flight Movement and its position of the Nose wheel.

- Deflection and strain sensors were mounted and all of them were connected by wire assembly which were brought at a single point where National instruments equipments were placed. The wires were plugged in the NI DAQ to acquire the desired reading of deflection and strain at various points.

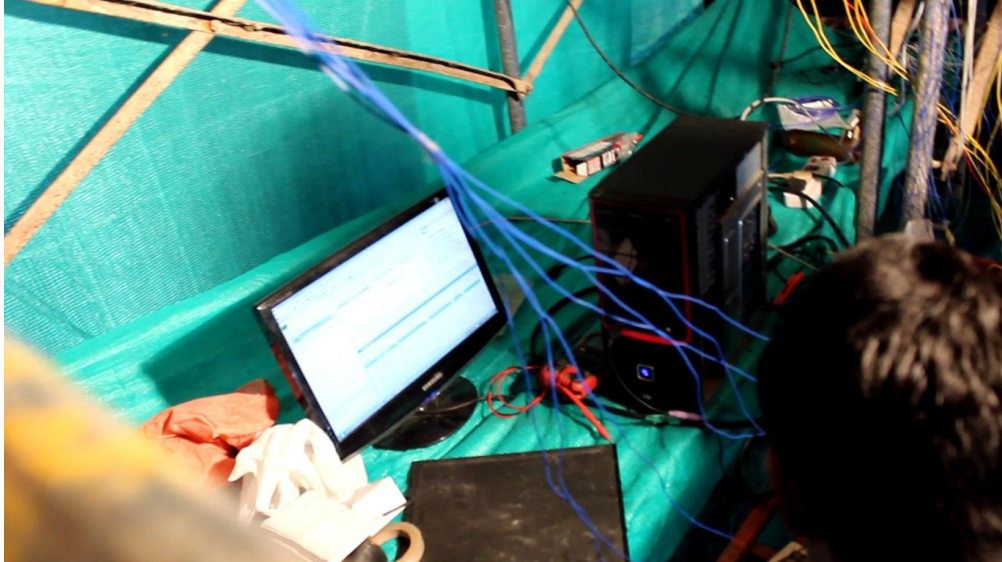


Fig : NI DAQ

- Overnight Testing was performed to record deflections of heavy flights. Readings were recorded and later on processed and the signals were filtered to obtain the Actual deflection and strain at that point.

CONCLUSION

- 1) It was observed that the deflection and strain was more at the cantilever portion where the front wheel and rear wheels of aircraft passes through.
- 2) At some points very less deflection was observed
- 3) At some points where deflection was more the graph rises and where no movement was observed the graph remains still.
- 4) The Exercise was successfully completed under the supervision of L & T Engineers and TCPL engineers. Sufficient data as required by the third party appointed by MIAL has been collected and for further analysis