Instrumentation and monitoring of segmental post-tensioned girders

Roberto Gomez[1], J Alberto Escobar[1] and Hector Guerrero[1]

[1] Structural Engineering Department, Institute of Engineering, UNAM, 04510 Mexico City, Mexico

E-mail: rgom@pumas.ii.unam.mx

Abstract. As a result of the failure of prefabricated segmental girders during their construction, and in order to evaluate the structural safety of the superstructures of three bridges, different activities of instrumentation, monitoring and mathematical modelling were performed. This paper presents the first stage of a study describing the tasks of instrumentation and monitoring of stresses in an isolated precast post-tensioned beam during the process of application of the tension loading, and before being placed in its final position. The main goal of this task was to confirm the transmission and distribution of stresses at segmental joints. Also, ambient vibration tests were carried out in different phases of tensioning, as well as in the final position of the girder. Recorded stories of accelerations are presented and fundamental periods of vibrating of the isolated girder are derived. The results of the measurements will be used for the calibration of mathematical models and simulation of different scenarios of loads and thus assess the structural safety of the different sections of the superstructures of the three bridges in question.