



Effect of Earthquake Directivity on Behaviour of PSC I-Girder Bridge

Arbab Adil¹, Md Imteyaz Ansari²

¹M. Tech. Student, Dept. of Civil Engineering, Jamia Millia Islamia, New Delhi

²Assistant Professor, Dept. of Civil Engineering, Jamia Millia Islamia, New Delhi

Abstract

Ground motions near to a fault are unlike from those which are detected further far from seismic sources. In near fault zone, ground motions at a specific site depend upon rupture mechanism and slip direction relative to site and by an everlasting ground displacement which results from tectonic movement. Depending on rupture mechanism and slip direction, ground motions in the near fault can show the dynamic consequences of “forward directivity”, “neutral directivity”, and “backward directivity”. Ground motions close to the surface rupture may incorporate a significant everlasting static displacement called as fling-step. Pulse type motions have been recognised as critical in the design of structures in near fault zone. Time histories which contain pulse like effect are needed when conducting dynamic time-history analysis for structures located near possible active faults. In this paper, an investigation is shown regarding the effect of the directivity pulses inherent in near-fault ground motions on behaviour of PSC I-Girder Bridge. To understand the earthquake directivity effect on the structures and to obtain a set of ground motions with dispersed directivity. A finite element model of PSC I-Girder Bridge is prepared, and the seismic investigations of the considered bridge structure is carried out for acquiring its response for earthquake directivity effect.

Keywords: Near-fault ground motion, Forward directivity, Fling-step, PSC I-girder bridge