

## **ABSTRACT**

The purpose of this dissertation is the study of the seismic behavior steel of and concrete composite moment frames. To achieve that, seven different frames have been designed and static and dynamic inelastic analyses have been carried out.

In the first chapter the composite moment frames are generally presented and their advantages and disadvantages are set out.

In the second chapter the seven frames have been designed according to Eurocode 4 and Eurocode 8. The seismic forces from the local earthquake resistance code have been used. Two groups of frames have been created. The first group consists of 4-storey frames and the second of 8-storey ones. For these frames the same section of beam and column was initially used in all stories.

In the third chapter the static inelastic pushover analysis was used to study the performance of the frames. Moreover, to assess the performance, the guidelines of the FEMA 356 were employed.

In chapter four dynamic inelastic analyses have been carried out for one of the designed frames. Seven real records from Greece have been used for seismic input and the average of their results was extracted. Then, the performance was assessed and the reduction factor of the seismic forces was calculated.

In order to better evaluate the performance of the frames, in chapter five the results of the two inelastic methods are compared.

Finally, in chapter six all the conclusions have been gathered and some comments are expressed about the design rules of Eurocode 8.