

## **Abstract**

Soil flexibility constitutes a very important factor that influences the overall behavior of a superstructure during static and dynamic loading. In the present Thesis the effect of soil-structure-interaction on the dynamic and seismic response of a bridge pier is studied. The model pier has been constructed at the EUROSEISTEST test-site in Volvi. Initially, a numerical simulation of the pier is performed for two types of foundation, i.e. a surface and a pile foundation. Then, for the pier with the surface foundation, the relationship between bending moment and rocking rotation is derived together with the relationship between bending moment and stress in the soil, under the foundation. Then, the response under dynamic loading of the system is studied, while the attenuation of the soil vibration due to inertial interaction with the distance is derived. Finally, the numerical analysis results is been compared with the respective experimental results. The final conclusion is that the numerical simulation than incorporates soil flexibility is in good agreement with the experimental results, thus allowing for further parametric analyses to be performed towards the study of SSI effects.