

## ABSTRACT

This report analyses the contact phenomena that take place between Ancient Greek multi-drum (or multi-block) columns with the optional presence of wooden shear connectors between them. This analysis is based on previous studies that have approached similar problems theoretically, experimentally, or numerically. The latter way was chosen to approach the aforementioned problem, with the help of the finite element analysis program **ANSYS 7.1 Multiphysics**. More than 1000 lines of code were developed in the form of an input file to help better understand the contact problem. The top part of this file contains switches and variables that help shape the model in a profound way. For instance, one can choose to perform a two-dimensional or a three-dimensional analysis, define the restraints, the materials, the loads, the dimensions, etc. by placing the desired values to the corresponding variables. One chapter is dedicated towards the better understanding of the input file commands, using references to the ANSYS manual itself.

In order to certify that the code functions in a properly manner, a series of trials is performed. The results from the models created using the code are verified using corresponding known theoretical results. They are also cross-referenced with the results of previous publications. Also, a modal analysis carried out to diagnose the weaknesses of multi-drum columns. A wide parametric analysis is performed. The corresponding variables are the model-types, the friction coefficients, and other elements. A specific modal analysis using the 1<sup>st</sup> eigenvalue helps us investigate the danger of collapse under relevant excitation. The results of all the above analyses are presented compediously in diagrams and relevant video clips can be given to anyone interested.

An addition aim of this report was also to complement a previous study (by others) that dealt with the rehabilitation of the Lindos Acropolis at the island of Rhodes. For this, a bit of information is presented about this project. Additionally, a realistic model that is similar to a real column of the Acropolis of Lindos is also solved and its results are furthermore commented.

The report ends with its general remarks and conclusions. The code of the input file is presented for everyone to see and comment.