David Beneke Consulting
Finite Element Analysis for Engineering

Printing Press Base
Natural Frequency and Harmonic Response Analysis

Date: May 2020

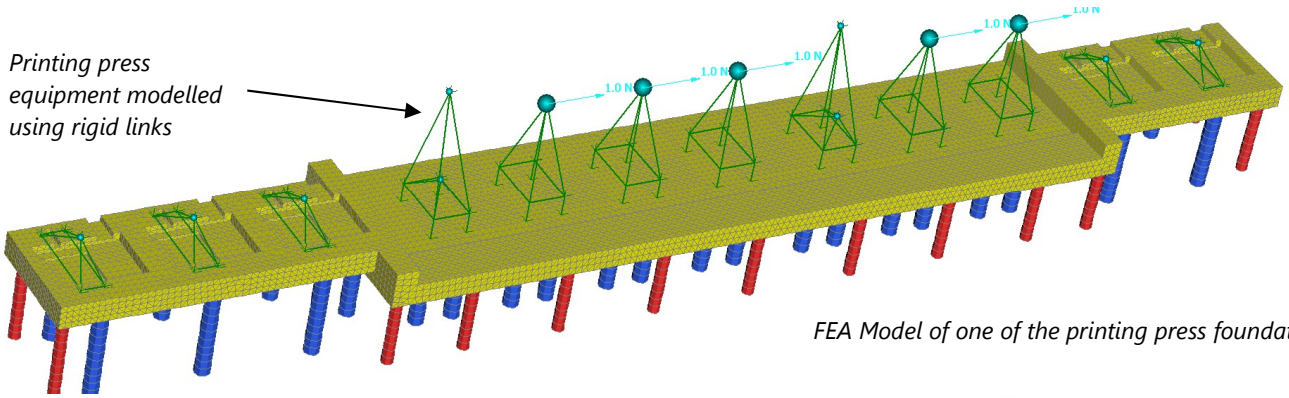
Client: FDC

Project Description:

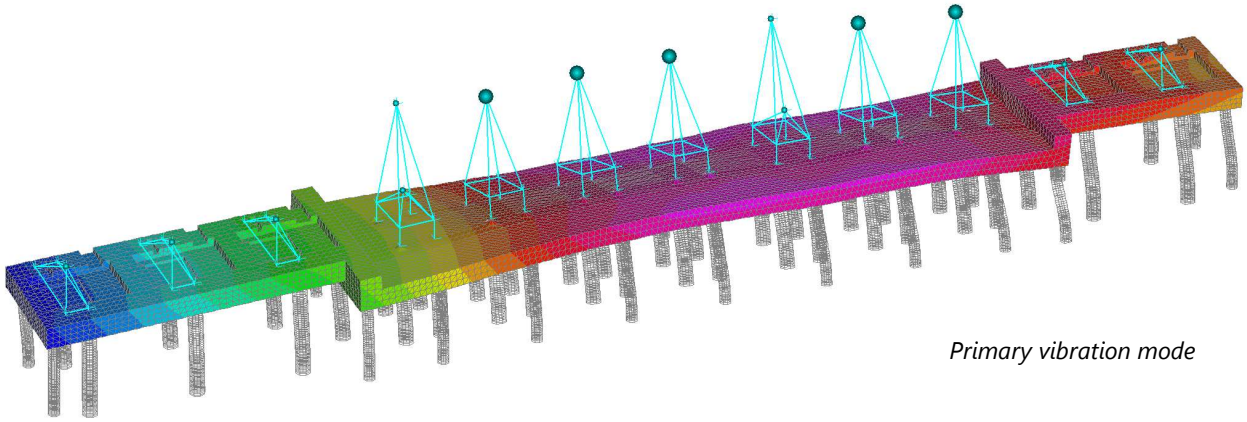
David Beneke Consulting was commissioned by FDC Building Contractors to undertake an assessment of a foundation structure which supports printing press equipment. The foundation structure was constructed from a conventional reinforced concrete slab supported by piles. The purposes of the analysis was to determine if the vibration of the printing press equipment caused deflections of the foundation which exceeded specified limits.

Based on solid model data supplied by our client, a 3D dimensional finite element analysis of the foundations and supporting residual soil/basalt subgrade was created. The solid model geometry was initially surface meshed, then mesh through its thickness using quadratic Tet 10 solid elements. The printing press equipment itself was idealised using a series of rigid link elements with nodal masses applied at the centre of gravity of each piece of equipment.

Initially, a natural frequency analysis was undertaken to establish the natural modes of vibration within the frequency range of interest. Then a harmonic response analysis was undertaken in order to determine the deflections of the structures under the rotating loads.



FEA Model of one of the printing press foundations



Primary vibration mode

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