



Client:

Established in 1977 and still managed by its two original directors, Balguard Engineering has established a trusted reputation for producing high-quality architectural metalwork across a wide range of industry sectors.

Based in Leighton Buzzard, and operating from a modern well-equipped factory, Balguard's highly skilled workforce deliver design and fabrication solutions to clients throughout the UK.

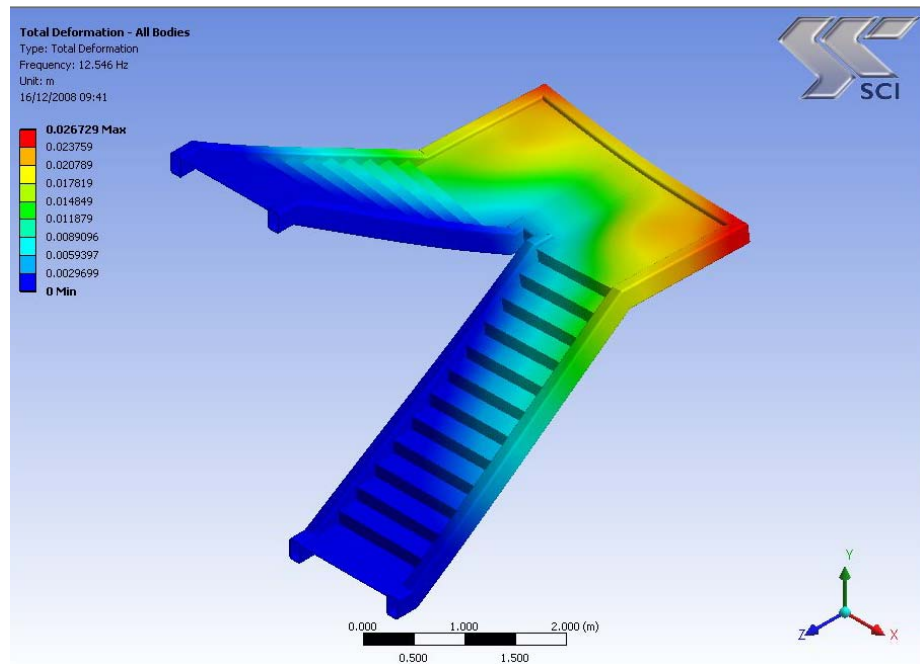
Every project is conducted in a professional and courteous manner, ensuring clients receive exceptional customer care and superior workmanship at all times.

As the company has grown, so too has its investment in people and equipment. Health and safety procedures are strictly adhered to at all times with staff undergoing regular training programmes and safety consultancy.

www.balguard.co.uk

Dynamic analysis of a steel staircase

SCI was approached by Balguard Engineering Ltd. to provide specialist consultancy services on a scissor staircase they were designing and constructing for use in an office building, to ensure that the staircase would meet the acceptability criteria for vibration.

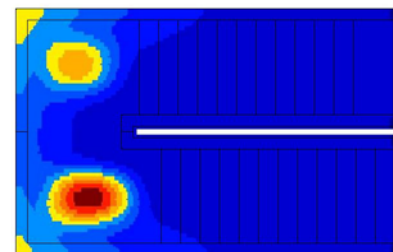


Finite element modelling

SCI prepared a finite element model of the staircase to determine the vibration characteristics of the structure such as the frequencies and the mode shapes – the deflected forms that the staircase will tend to adopt when it is vibrating. The first mode shape is shown above.

Assessment and comparison to the Standard

Using the output from the finite element software, SCI used the analysis methods detailed in P354 – Design of Floors for Vibration: A New Approach together with force inputs defined in the current standard appropriate for the assessment of vibrations, ISO 10137. This produced a contour plot for the staircase showing the location and magnitude of the liveliest vibrations that would be caused by someone walking down the stairs. These magnitudes could then be compared to limiting vibrations defined in the Standard.



Providing specialist skills

Balguard's Design Manager comments; 'SCI worked with us providing specialist skills and software that supplemented our own expertise which helped us to swiftly complete our work on this project.'