

# Isolating Turbines with a Fully Decoupled Inertia Slab

## Aim

A leading Biotech company was installing a Co-Gen plant in the basement of their new state of the art facility.

The close proximity of the Co-Gen equipment (e.g. generators, turbines, pumps, and condensers) to office spaces, an aviary for research animals, and sensitive laboratory equipment presented great concern for machinery generated vibrations. The vibrations from the machinery could easily become structure borne and have a great affect on the building and overall research success. Vibrations in the structure will add stress to the building that overtime could potentially create cracks and cause overall weakness of the building. These same vibrations may disturb the research animals. Such disturbances can affect the habits (i.e. sleep and comfort level) of the animals and therefore overall accuracy of the testing being done. Another concern for test accuracy is the affect of vibrations on the various pieces of lab equipment. A perfect example of this is the optical clarity of high-resolution microscopes. In order to produce such high resolutions these microscopes must be kept free from any external interference like vibrations. Otherwise, the benefit of such a precise piece of equipment is totally lost.



## Solution

In order to develop an appropriate and properly functioning solution initial analysis of the structure, turbine, and generator was required. Such analysis includes reviewing the natural frequency of the building, disturbance frequencies and operating speeds of the machinery, center of gravity etc.

Based on this analysis it was determined that the simplest effective solution would be a fully decoupled inertia slab. This inertia slab was fully isolated with Sylomer® materials underneath and around the perimeter targeting at a natural frequencies

of 12.5 Hz in vertical direction and 10 respectively 11 Hz for the tilting modes.



A full set of documentation was given to the operator including installation plans and step-by-step instruction for installation in order to ensure a smooth implementation. The subsequent measurements did show the high efficiency of the proposed solution with insulation values of almost 10 dB at 31.5 and more than 25 dB at 315 Hz.

