

AHU Silencer Specification for Amazon Warehouse in Warrington

Background

Miller Goodall Ltd (MGL) was appointed to undertake an assessment of internal noise levels within the main warehouse and associated office spaces due to the operation of 14 AHU and a large kitchen extract fan located externally around the perimeter of the building.

Noise from the air handling plant needed to be assessed in terms of 'duct-borne' noise (noise travelling from the plant fans through the ventilation ductwork and into occupied spaces) and 'structure-borne' noise (noise travelling from the plant equipment through the structure of the building and into occupied spaces).

11 large AHUs provide supply and extract ventilation for the main warehouse, which has a total volume of over half a million cubic meters. Four additional units of large ventilation plant were used to serve the associated offices spaces around the perimeter of the building. Each of the occupied spaces being served by the plant have their own criteria for internal noise levels; our calculations had to determine if these noise levels were being achieved, and if not how much attenuation would be required in order to do so.

Action Taken

Extensive calculations were undertaken to assess the relative contributions to internal noise levels in occupied spaces due to AHU fan noise travelling through the façade of the building and via the ventilation ductwork (including noise 'breaking out' or travelling through the metal walls of the ductwork itself).

The accumulated loss of noise levels as it passes through various components within the ventilation ductwork was calculated for the duct runs of each AHU, to all areas of the building, and overall noise levels for occupied spaces were calculated.

Noise levels within plant rooms was also calculated so that the contribution to noise levels due to noise passing through the building structure could be assessed.

The predicted noise levels were compared to the criteria provided by Amazon, and were found to be too high. In order to achieve Amazon's internal noise levels, attenuators for the air handling plant were specified in terms of the required 'insertion loss' for each attenuator. Suitable wall and ceiling constructions were also specified that would ensure noise travelling through the façade of the building do not cause an exceedance of the internal noise level criteria.

Summary of Findings

Insertion loss requirements were provided for the attenuators that would need to be installed into each air handling unit and kitchen extract fan plant. Construction advice for the building facades adjacent to plant rooms was also provided. The combination of these measures had been carefully balanced in order to achieve suitable internal noise levels within the various occupied spaces without over specifying the attenuators and construction materials.

For more information about us, visit our website at www.millergoodall.co.uk. If you would like to discuss how we can help your project, please contact Miller Goodall on 01204 596166 or email info@millergoodall.co.uk.