

Noise Control from Air Conditioning Plant

The Library Service of East Lothian Council (ELC) occupies a converted industrial building in Dunbar Road, Haddington. ELC's Community Property and Management (CPM) proposed upgrading the air conditioning and heating to improve the thermal comfort for building users.

The proposed plant included the installation of air handling units, boiler plant and air cooled condensers outside the building, as well as internal ducting. The external works required a noise impact assessment as part of the planning application.

Noise from the proposed plant included fans, boilers, flue and duct exhaust and heat exchange units, immediately adjacent to housing.

Although the library buildings are not used at night, the heating and cooling systems sometimes operate early in the morning, before 07:00, leading to potential adverse effects such as sleep disturbance to local residents as well as loss of amenity in garden areas.

Operational noise was assessed in accordance with BS 4142: 1997 Method of Rating Industrial Noise Affecting Mixed Residential and Industrial Areas, World Health Organisation Criteria and NR20, as required by local Environmental Health officials.

Noise levels were predicted using an advanced computer model and noise source estimates underwritten by commercial guarantee. Noise levels were predicted across the study area at 1m resolution using octave band data. Several layout options were considered as part of the design process, to help ensure the proposal met required standards.

The assessment assumed worst case conditions, where all plant is operating at night and both heating and cooling plant are operating at the same time.

The final design proposed relocating and enclosing the air cooled condensers, specifying silencers to flue and air exhausts, and erecting acoustic barriers on the site boundary to protect garden amenity. The predicted noise was <5 dBA above the measured background. Noise levels inside habitable rooms were predicted to comply with all relevant criteria.

The installation was subsequently approved and constructed and has operated without provoking any noise complaints from local residents.

