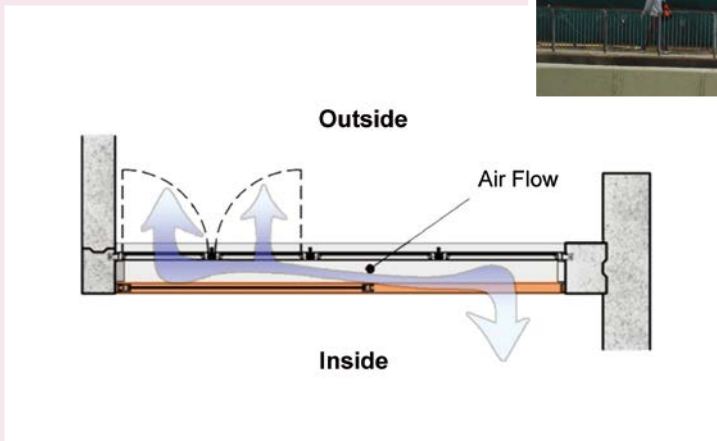


Acoustic Windows and Acoustic Balconies – Two Innovative Noise Mitigation Measures



Mock-up flats

Air flow of acoustic window

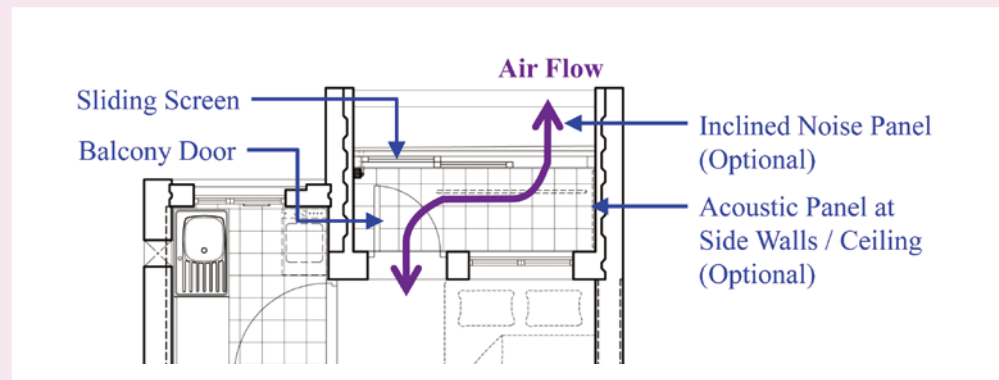
Road traffic noise has always been a challenging issue for public housing development in urban areas. In response, the HA has carried out a number of research and development activities aimed at developing noise mitigation measures specific to the Hong Kong environment, while also creating a healthier living environment for residents in our public housing estates. The challenge we have faced in integrating these noise mitigation features into an optimum building design was in balancing them against other important needs such as natural ventilation and lighting.


Acoustic Windows

At sites close to heavily trafficked roads, conventional mitigation measures are not enough to reduce the impact of traffic noise. We therefore collaborated with the Environmental Protection Department and the Hong Kong Polytechnic University in developing a design for an acoustic window for residential buildings, which functions as a modified double-glazed window with offset openings to allow for natural ventilation. Laboratory testing of the design concept followed by on-site testing of the actual window design at mock-up flats established that the acoustic window was effective in abating traffic noise. The design configuration of the acoustic window was subsequently endorsed by the Buildings Department. During the design process other factors were also taken into account, such as its accessibility for residents for window cleaning and hanging of cleaned laundry, and maintenance requirements.



 The first generation acoustic balcony at Wing Cheong Estate



 Layout of the enhanced acoustic balcony

Acoustic Balconies

Our first generation acoustic balconies were designed and installed in Wing Cheong Estate, completed in 2013, to reduce road traffic noise from the nearby West Kowloon Corridor. The design included a solid parapet wall and side walls together with an inclined panel on the balcony parapet to reduce the noise entering the flat. Sound absorption materials were also installed on the ceiling and side walls of the balcony.

Although the innovative acoustic window and initial acoustic balcony were successful, we continued to explore enhancements and came up with a second generation balcony design which performs more effectively in terms of reducing traffic noise. On top of the basic noise mitigation features of the original acoustic

balcony, the enhanced design includes an additional sliding screen installed on the balcony parapet just in front of the balcony door, which further reduces traffic noise coming into the flat.

On-site noise assessment undertaken in full-scale mock-up flats was completed in 2015. This verified that the enhanced acoustic balcony was able to deliver a good performance in residential developments, and this valuable noise mitigation design feature is now being considered for inclusion in some of our future public housing development projects.