

**Civil Service Outstanding Service Award Scheme 2019**  
**Housing Department, Environmental Protection Department,**  
**Buildings Department**  
**New Approach to Mitigate Traffic Noise at Public Housing Development Projects**  
**Acoustic Windows and Acoustic Balconies**  
**(5-minute Version)**

Screen Content:	<p>Busy city scenes of Hong Kong.</p> <p>A large number of vehicles traveling near residential area causing traffic noise.</p>
Voice Over:	<p>Hong Kong is a densely populated place. Busy city activities inevitably create noise, causing nuisance to the public, and traffic noise is often a major issue. In view of this, the Housing Department in collaboration with the Environmental Protection Department and Buildings Department has designed the acoustic windows and acoustic balconies for installation in the public housing estates.</p>
Screen Content:	<p>Scenes that show the windows of public housing estates.</p>
Key-on Caption:	<p>Housing Department, Environmental Protection Department, Buildings Department</p> <p>New Approach to Mitigate Traffic Noise at Public Housing Development Projects</p> <p>Acoustic Windows and Acoustic Balconies</p>
Screen Content:	<p>Scenes that show the noise pollution created by the construction sites and the heavy traffic next to Yau Lai Estate. Shots of the acoustic windows installed at Shun Lai House of the Yau Lai Estate.</p>
Voice Over:	<p>In Shun Lai House of the Yau Lai Estate, some units are facing the portal of the Eastern Harbour Crossing with heavy traffic, and in the nearby area, there are also quarries and construction sites. The Housing Department installed acoustic windows in these units to reduce noise nuisance caused to the residents.</p>
Key-on Caption:	<p>Mr. Law</p> <p>Resident</p>
Mr. Law:	<p>I've left the acoustic windows open at night and I could hear the noisy traffic. It becomes very quiet when I closed the acoustic windows. I can sleep until dawn. I keep the acoustic</p>

	windows open in the day time for good ventilation and to keep the place cool. It is environment-friendly as I don't need to turn on the air conditioning often!
Screen Content:	Resident is cleaning the acoustic windows.
Voice Over:	Mr Law, the resident, highly appreciates the design of the acoustic windows which reduces the traffic noise, and it is easy to take care of them. Mr Fung, who also lives in Shun Lai House, thinks that the design of the acoustic windows caters well for the needs of the residents.
Key-on Caption:	Mr. Fung Resident
Mr. Fung:	It provides an additional layer of glazing. When I hang my clothes outside, I just slide open the acoustic window. The windows on both sides can be pushed open like this.
Screen Content:	Resident opens the acoustic windows to hang their clothes. Close-up shots of the acoustic windows.
Voice Over:	The design of the acoustic window looks simple, but it has come a long way from design, development through to implementation. It was a collaboration project of the Housing Department, Environmental Protection Department and Buildings Department. With the use of innovative technology, and based on the concept of "people-orientation" and "sustainable development", we successfully implemented the acoustic window.
Screen Content:	Colleagues of the Housing Department, Environmental Protection Department and the Buildings Department performing various work tasks. Shots of the exterior of Shun Lai House and acoustic windows.
Key-on Caption:	Ngai Pui-yan, Jo Architect Housing Department
Ngai Pui-yan, Jo	The Housing Department strives to optimise the use of our scarce land resources. In every project, we make sure that the land usage will deliver the best possible benefits. We aim to provide a good quality living environment for the residents based on the "people-oriented" design concept, and alleviating the impact of traffic noise in building design is one of our key goals.

Screen Content:	Colleagues of Housing Department discuss among themselves. Scenes that show a large volume of traffic near residential area.
Voice Over:	For years, building design in Hong Kong has evolved to deal with the traffic noise impact. In 2009, the Housing Department, Environmental Protection Department and Buildings Department collaborated to develop various measures on mitigating the traffic noise impact.
Screen Content:	Colleagues of Housing Department, Environmental Protection Department and Buildings Department are having a meeting.
Key-on Caption:	Yeung Kwok-leung, Maurice Senior Project Officer Environmental Protection Department
Yeung Kwok-leung, Maurice:	We came up with this simple design of a quasi double-glazed window, which has an alley between the two layers of glasses. Then we made use of the principle of sound absorption, diffraction and reflection to achieve the noise reduction effect. Based on this concept, we carried out simulations in the laboratory and obtained positive results. We then shared our findings with colleagues of the Housing Department. They agreed that it could be put to practical application.
Screen Content:	Shots of the middle section of the acoustic windows. Colleagues of Environmental Protection Department conduct simulation and test the effectiveness of the acoustic windows.
Key-on Caption:	Cheng Kam-ming, Anson Building Surveyor Buildings Department
Cheng Kam-ming, Anson:	Traditionally, noise reduction and natural ventilation belong to two different and contradictory categories. Usually noise reduction is achieved at the expense of natural ventilation, and vice versa, good natural ventilation may compromise the noise reduction effect. We hope to devise a standard compliant acoustic window design, which meets the statutory requirements for natural ventilation, achieving noise reduction effect, and has wider applications as well.
Screen Content:	Close-up shots of the acoustic windows from inside of the unit to the outside.
Voice Over:	As soon as it was confirmed that the acoustic windows could

	<p>be adopted to mitigate the traffic noise impact, the three departments worked together in the areas of design, exploring the choice of materials, ascertaining statutory requirements and users' needs, etc. Our work included continuous testing in various aspects and data collection, modification and fine-tuning of the design. The idea of acoustic window was gradually turned into a reality.</p>
Screen Content:	<p>Colleagues of Housing Department, Environmental Protection Department and the Buildings Department carry out their own work and hold meetings.</p>
Ngai Pui-yan, Jo:	<p>We set up an actual size mock-up flat using the acoustic windows in San Po Kong, and conducted tests in comparison with the actual flat using conventional window design to verify that the acoustic window could reduce the traffic noise impact effectively, and at the same time maintain natural air ventilation and natural lighting, as well as other factors that we needed to take into consideration.</p>
Screen Content:	<p>Shots of the field model located in San Po Kong. King Tai Court, which is located at location impacted by heavy traffic, is fully installed with acoustic windows.</p>
Voice Over:	<p>Through collaborations and concerted efforts of departments, the acoustic windows were finally adopted in King Tai Court, which has its first occupants in 2017. As it is situated at a location impacted by heavy traffic, it was the first public housing estate fully installed with the acoustic windows. In 2018, the acoustic windows were formally introduced into the modular flat design of public housing estates.</p>
Screen Content:	<p>Colleagues enter the units and check the functionality of the acoustic windows.</p>
Yeung Kwok-leung, Maurice:	<p>We have a range of measures for different housing estates and for units of different sitting direction. For example, we can install sound absorption material to enhance the noise reduction effect. Overall speaking, having conducted testings and on-site verifications, we find that the acoustic window can reduce noise as high as 8 decibels. In general, if traffic flow is reduced by half, noise is reduced by 3 decibels. So it produces very satisfactory results.</p>

Screen Content:	<p>Shots of sound absorption material.</p> <p>Photos of acoustic balconies.</p> <p>Colleagues from different departments are performing work tasks.</p> <p>Close-up shots of public housing estates and acoustic windows.</p>
Voice Over:	<p>The design concept of acoustic window jointly developed by the Housing Department, Environmental Protection Department and Buildings Department can also be deployed to construct “Acoustic Balconies”. The combined effort of the three departments in the development of “acoustic windows” and “acoustic balconies” showcases an exemplary cross-departmental innovative collaboration. The Housing Department will continue to use the design concept of acoustic windows and acoustic balconies to optimise land resources and increase flat yield.</p>
Key-on Caption:	<p>Civil Service Bureau</p> <p>The Government of the Hong Kong Special Administrative Region ©2020</p>