



PROJECT NAME: TuenMun Road Bus-Bus Interchange's Improvement Project
SUPPLIER: Solcon Limited

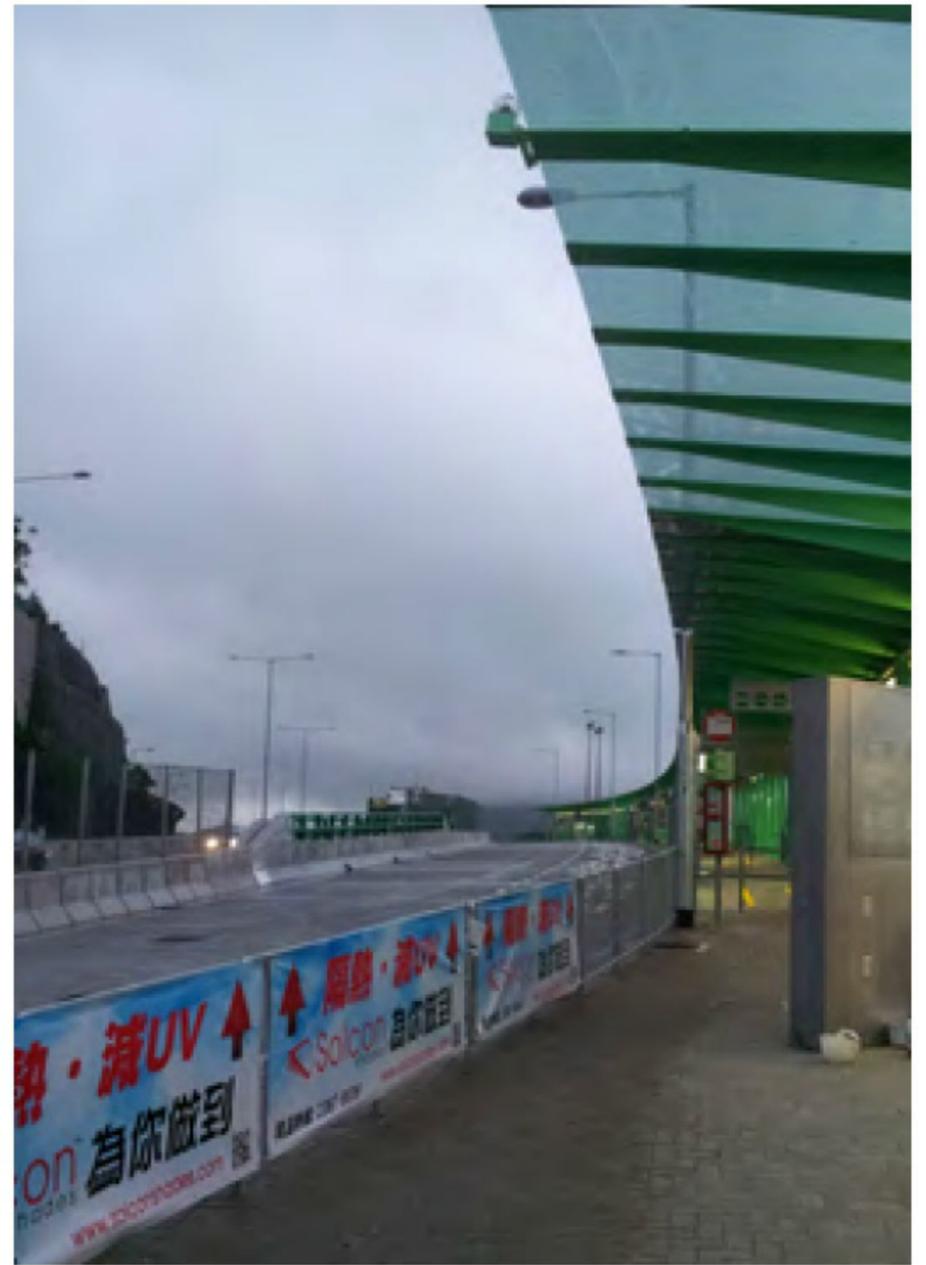
The TuenMun Road Bus-Bus Interchange's improvement project was completed and officially launched on 27th July, 2013, after 30 days. The project came about due to feedback from the public and TuenMun district council member, Mr Yan Tian Sheng, on the unbearable heat retention of the original design. The interchange is located on TuenMun Road (Kowloon-bound) near Siu Lam Interchange.

Initially, passengers had to wait for buses in extremely hot and humid weather conditions, especially in the summer as the interchange was exposed to direct sunlight, in the absence of tall buildings and trees surrounding the interchange. In addition, the shelter is made from the transparent polycarbonate board with a 30% shading rate—it does not block the sunlight and excessive glare.

An emergency room doctor pointed out that if people are exposed to strong sunlight for over 10 minutes, they are more susceptible to heatstroke. Also, long-term exposure under excessive sunlight will accelerate eye macular degeneration and the heavy glare will affect the pupil, leading to severe headaches.

In addition, this type of material makes the application of solar control film difficult since the properties of polycarbonate board differs from glass and may easily peel off. According to a newspaper article published on 18th June 2013, it mentioned that over 60% of sunlight could pass through the polycarbonate board and the temperature was 32.6°C at the interchange under direct sunlight, proving that the shelter was ineffective in shading from the commuter's point of view.

To address this, Solcon Ltd installed about 3,000 square metres of solar control film at the shelter as requested by the Highways Department. To solve technical problems, the company communicated closely with the



manufacturer. The selected solar control film has been tested many times to ensure that it would not peel off from the polycarbonate plastic board and has also been assessed by the Highways Department. Solcon's solar control film provides extraordinary solar control with a subtle grey finish from the outside. It provides superior heat protection in high temperatures, helps correct temperature imbalances of the interchanges, and provides ultraviolet rejection by blocking more than 97% of harmful UVA rays. It also lowers the chance of heatstroke and helps to create a safer and more comfortable environment for the passengers.

At 10:30am on 27th July 2013, digital solar power meters were used to measure the visible light transmittance and the temperature of solar radiation at the interchange. A huge difference was discovered before and after the installation of the solar control film. Before the installation of solar control film YNT 10, the solar radiation was about 266 BTU/ (HR*FT²), while it was just 129 BTU/ (HR*FT²) after the installation. The solar radiation had been reduced over 50% (Chart 1). Apart from YNT 10, the solar control film SI-45 was also tested and produced satisfying results. The solar control film SI-45 functioned well and reduced around 45% of solar heat energy (Chart 2).

Solcon's solar control film can block a vast amount of solar energy, protect passengers against the strong glare, and help defend against the dangers of UV induced skin diseases and photosensitivity. According to research, many commuters feel that there is a huge difference after the installation of the solar control film.

Case Study – Tuen Mun Road Bus-Bus Interchange’s improvement project

After 30 days, Tuen Mun Road Bus-Bus Interchange’s improvement project had been completed and was officially opened on 27th July, 2013.

Previously, the public and the Tuen Mun District Council Member Mr Yan Tian Sheng keep the Government informed of the interchange had not considered in detail of the solar heat rejected design. Therefore, passengers needed to wait for a bus under an extremely hot weather especially in summer.

Tuen Mun Road Bus-Bus Interchange located on Tuen Mun Road (Kowloon-bound) near Siu Lam

Interchange. The interchange has been exposed to direct sunlight since there are no any tall buildings and trees surrounded the interchange. In addition, the shelter is made by the transparent polycarbonate board with 30% shading rate. It cannot block the sunlight and excessive glare. Passengers were forced



Before installation

to wait for a bus under a hot and muggy environment and the dazzle of the sunlight made passengers very uncomfortable. An emergency room doctor pointed out that if people expose to strong sunlight over 10 minutes, it is easy to suffer from heatstroke. Also, long term exposure under the sunlight will accelerate eye macular degeneration and the heavy glare will affect the pupil and even lead to severe headache. In addition, this kind of materials is difficult to apply solar control film since the properties of polycarbonate board is totally different from glass, it can easily peel off if solar control film is applied. According to the newspaper published on 18th June 2013, it mentioned that over 60% of sunlight can pass through the polycarbonate board and the temperature was 32.6°C at the interchange under

direct sunlight. It proved that the shelter is useless from the point of passengers view.

In this regard, our company –Solcon Ltd had installed about 3,000 square meters solar control film at the shelter as the Highways Department requested. To solve the technical problems we faced, Solcon Ltd had communicated with the professional solar control film’s manufacturer. The selected solar control film has been tested for many time to assurance that it will not peel off from the polycarbonate plastic board and passed by the Highways Department. By using Solcon’s solar control film, the problem of the interchange has been solved and provides extraordinary solar control with a subtle grey finish from the outside; provides superior heat protection in high temperature; helps to correct temperature imbalances of the interchanges; provides ultraviolet rejection by blocking more than 97% of harmful UVA rays. It also reduces the heatstroke opportunity and helps to create a safer and more comfortable environment for the passengers.



The outlook after installation of the solar film– YNT10

At 10:30am on 27th July 2013, Our Staff using digital solar power meter to measure the visible light transmittance and the temperature of solar radiation of the interchange. A huge difference was discovered before and after the installation of solar control film. Before installation of solar control film YNT 10 , the solar radiation was about 266 BTU/ (HR*FT²)while it is just 129 BTU/ (HR*FT²) after the installation. The solar radiation had been reduced over 50%(Chart 1). Apart from YNT 10, we also tested the solar control film SI- 45 and the test result was satisfying. The solar control film SI- 45 functioned very well and it reduced around 45% solar heat energy (chart 2).It proved that our solar film works effectively. Solcon's solar control film definitely can block lots of solar energy, protects the passengers against the strong glare and helps defend against the dangers of UV induced skin diseases and photosensitivity. According to our research, many customers think that there are huge difference after installation of the solar control film. In addition, many passengers mentioned that the interchange was not so hot compared with past, the temperature seem to be reduced and there are no more strong glare after the installation of the solar control film.



Before installation, the solar radiation is 266BTU/ (HR*FT²)



After installation, the solar radiation is 129BTU/ (HR*FT²)

Chart 1 - Solar Heat Energy Testing - Solar Film YNT10

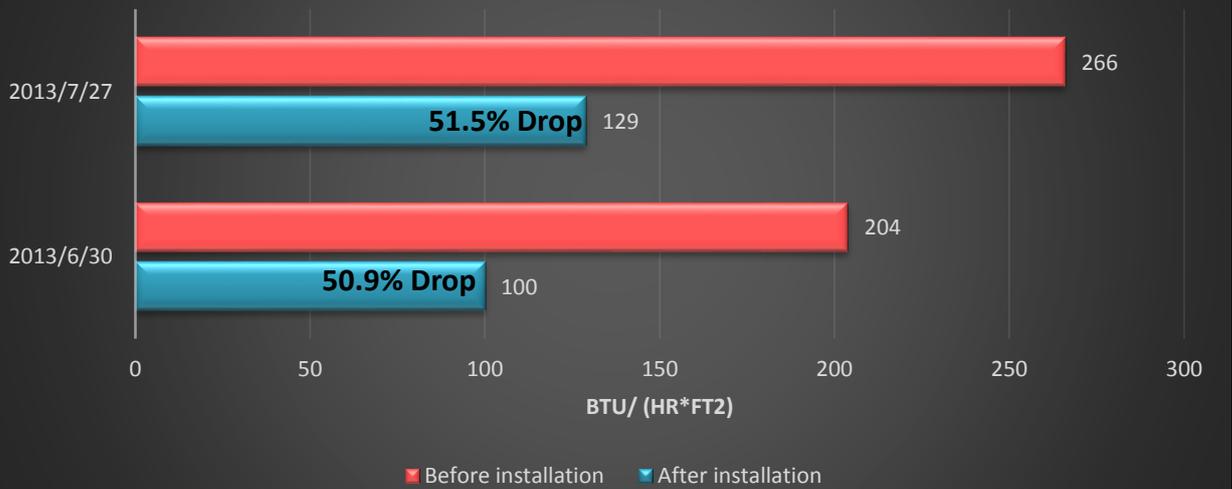
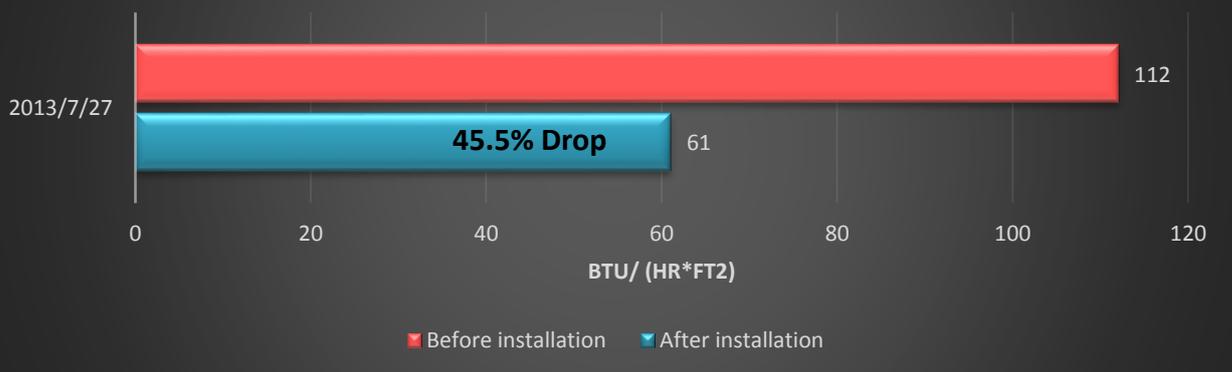


Chart 2 -Solar Heat Energy Testing - Solar Film SI-45



* BTU/ (HR*FT²) is the fundamental unit of heat flow. It measures the power per unit area of incident solar radiation the meter's sensing area.