

Case Study

The Trade and Industry Tower in Kai Tak

The Trade and Industry Tower (TI Tower) in Kai Tak is a prominent green building project that consists of a government offices building and a community hall. With a total net operational floor area of around 33,000 square metres, the 22-storey office tower accommodates 9 government bureaux and departments.



Overall view of TI Tower from Concorde Road



View of roof garden



View of photovoltaic panel on upper roof



Greening on the roof of the community hall

The building integrates a number of passive design in architecture and active design features which puts strong emphasis on energy conservation and greening. Lush landscaping was planted on the ground floor, elevated walkway and the roof. The office tower has a special vertical green belt on the building façades, a “green ribbon”, which comprised a series of vertical terraces climbing up the office tower to the roof garden. To maximise energy efficiency, the building is connected to the District Cooling System for air-conditioning. This feature also allows us to make use of more space on roof level for greening and photovoltaic panels.



Vertical greening on building façades

The building achieves high thermal performance of building envelope by using double glazing as well as both vertical and horizontal sunshades. With this high performance façade system, the energy efficiency of air conditioning can be optimised.



Close up of the vertical sunshades (left) and application of sunshades in different areas of the façade (right) to reduce heat gain and glare.

In addition, the building equips with various renewable energy devices, including:

- Building integrated photovoltaic panels (BIPV);
- Solar hot water systems;
- Solar chimney;
- Solar tracking optic fiber light pipe;
- Anidolic light pipes; and
- Daylight sun-tubes



Outlet of the solar chimney in the community hall roof



Solar chimney in the basement carpark



Solar chimney in the community hall foyer

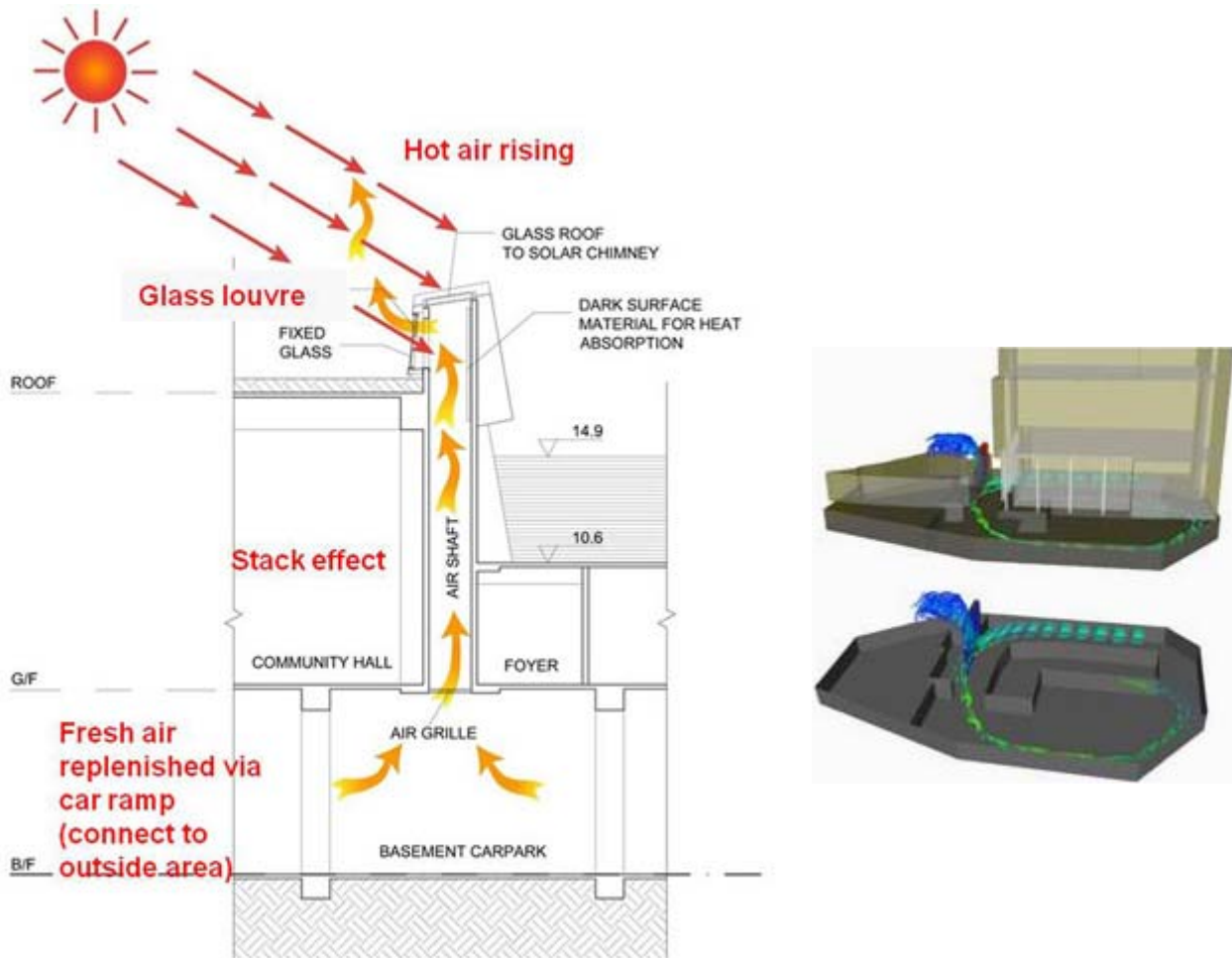


Diagramme showing the mechanism of solar chimney (left). It utilise solar heat to warm up the air at the top of an open shaft, thereby producing natural ventilation of occupied space under the shaft. Computational fluid dynamics diagram showing the induced air flow in the carpark (right)



Solar Tracking Optic Fibre Light Pipes maximise sunlight collection by use of automatic solar tracking devices

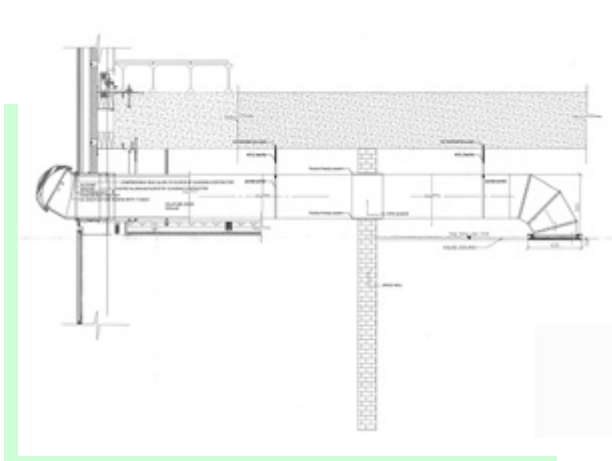


Photo showing the anidolic light pipes in the façade for Building Management Office (left). Diagram showing the anidolic light pipes (right), configured to transmit sunlight horizontally.



Anidolic light pipe in the Building Management Office providing similar luminosity to traditional lighting



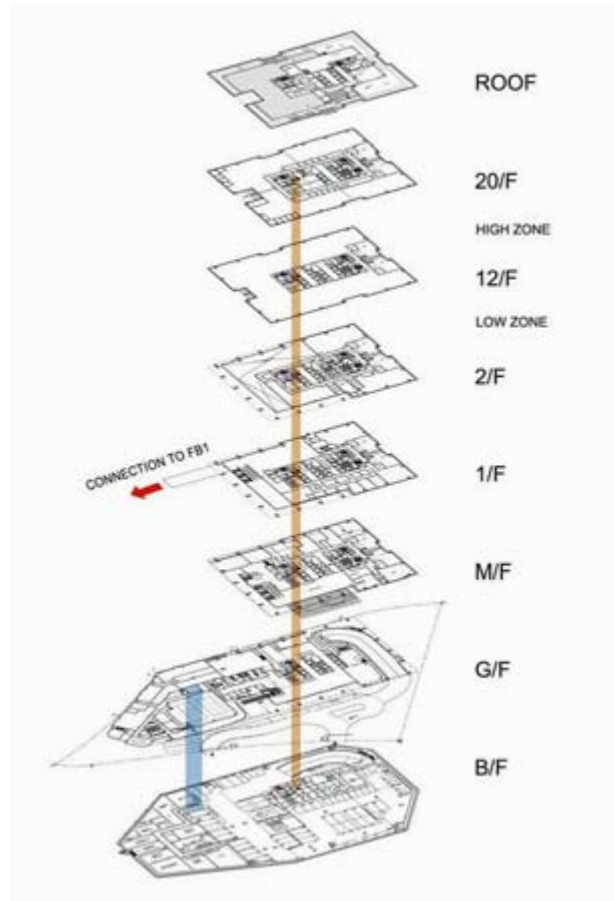
Sun pipes transmit sunlight from the roof of the community hall (left) through high reflective internal surfaces to the multi-purpose hall (right)

Apart from the above design features, the building also adopted free cooling to office spaces, heat recovery wheel, brushless DC motors for fan coil units, heat recovery from condensate and lift regenerating power to reduce energy consumption and maximise energy efficiency.

Other environmental features adopted in the project include automatic refuse collection system, rainwater collecting and storage system, use of recycled materials, adaptive and modular design for office area, life cycle assessment on structural elements, dripping irrigation system and water saving sanitary fittings.



Refuse disposal inlets for paper and general waste are installed in each floor and inlet for general waste on Ground Floor (top) and a central refuse collection station (bottom) is set at the basement



Schematic diagram showing the automatic refuse collection system (ARCS) in TI Tower. The system achieves clean and hygienic environment; saves manpower; reduces nuisance work; facilitates recycling of waste paper; and reduces lift traffic loads

The building also features an education path to enable the public to understand and appreciate various sustainable features. Interactive display and signage totem have been established as part of the education path.



Interactive display panels in 1/F lobby to enable the public to learn various sustainable features adopted in TI Tower

