



PUBLIC HEALTH LABORATORY CENTRE – A MODERN FUNCTIONAL BUILDING DESIGN WITH ENVIRONMENTAL AND ENERGY EFFICIENCY CONSIDERATIONS



Commissioned in 2001 and with a total gross floor area of 27,000m², the Public Health Laboratory Centre is located at Nam Cheong Street, Shek Kip Mei. This 15 storey premises is a multifunctional building consisting of 3 lower levels of car park, three floors of office accommodations whilst the upper 7 floors are laboratory areas, and other supporting facilities such as cold rooms, cultivation/incubation rooms, autoclaves, conference/seminar rooms, and a multi-purpose hall.

The project team for the construction of the Public Health Laboratory Centre are the Architectural Services Department (project manager, architect, structural engineer and the building services engineer) and Shui On Construction Company Limited (main contractor).

In view of environmental and energy efficiency considerations incorporated into the building design of this multi-functional premises, the Public Health Laboratory Centre was submitted for certification to HK-BEAM (the Hong Kong Building Environmental Assessment Method) in 2002. These innovative and sustainable design achievements accomplished the highest HK-BEAM rating of *Excellent*. Examples of these environmental building design features include :

OPTIMISATION OF DAYLIGHTING AND COOLING THROUGH BUILDING ENVELOPE DESIGN

To maximize comfortable natural lighting for building users, laboratories and offices are arranged along the outer perimeter of the premises. To combat against solar heat gains, sun shading structures are purposely designed onto the external façade. Elsewhere, such as in the lift lobbies, sunshading is provided by silk-screened glass and wide projecting horizontal fins.

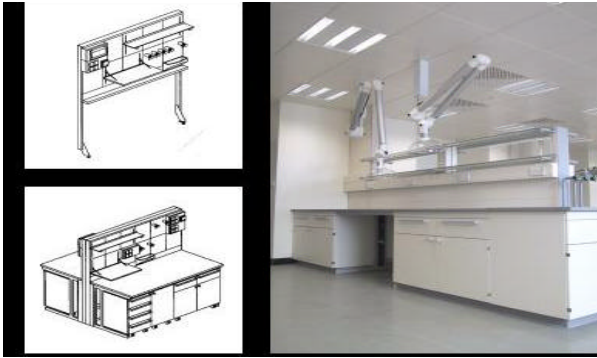


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WASTE MINIMISATION - FLEXIBLE DESIGNS AND LAYOUTS

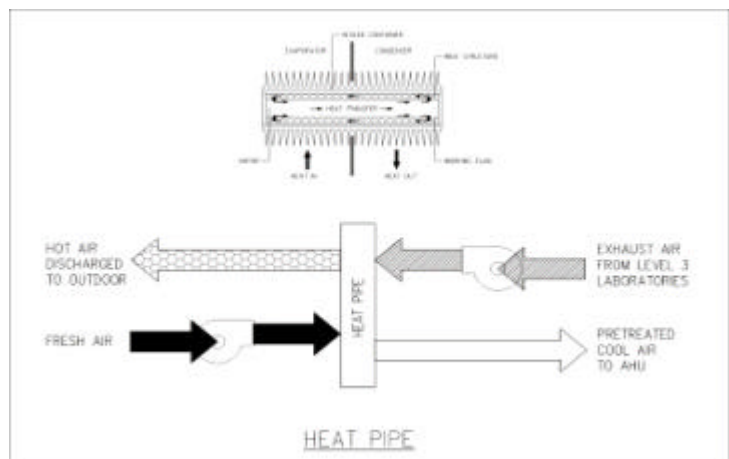


Prefabricated and flexible design are extensively adopted to minimise waste generation during construction and operation of the premises (for refitting and renovation works). Examples of these include, demountable dry wall partitions, modular laboratory furniture and services, and pre-fabricated pipework and airduct (all with insulation cladding).

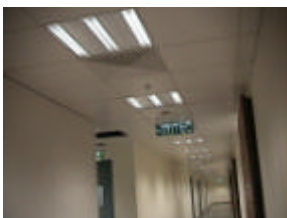
ENERGY EFFICIENT BUILDING SERVICES INSTALLATIONS

The air conditioning system design includes two 1125kW *heat recovery chillers* to reduce electricity consumptions for laboratory hot water and hot water pre-heating. Furthermore, the chilled water and air handling systems contain *variable frequency drive pumps* (@150 litre/sec) and fans designed to reduce power consumption under part load conditions.

To avoid the risk of cross contamination, rather than a traditional thermal heat wheel system, heat pipes (@180kW) containing coolants have been employed to recover "cooling" energy from biosafety hazard Level 3 laboratories and level 3 animal houses exhausts to pre-cool the incoming fresh air supply. The estimated payback period for the employment of this energy efficiency device is less than 10 months.



The ventilation systems for the enclosed car park in the premises are equipped with carbon monoxide sensors which automatically adjusts exhaust air flow rates to optimise indoor air quality. In addition, with a view for energy efficiency, at periods of low car parking usage, the ventilation systems will be switched to half speed mode when detected carbon monoxide levels permit this.



The lighting system design in the premises addresses both visual comfort and energy efficiency, with the adoption of state of the art T5 florescent lamps, fitted with low loss electronic ballast in occupied areas such as offices and laboratories. The projected payback period for the use of this energy efficient lighting system is around 1.5 years.



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