

Legislative Council Panel on Housing

Continuous Improvements in Lighting Systems Design for Domestic Buildings' Common Areas in Public Rental Housing Estates

Purpose

This paper aims to brief Members on the continuous improvements in lighting systems design for domestic buildings' common areas in public rental housing (PRH) estates of the Hong Kong Housing Authority (HA).

Background

2. Over the years, in response to the rising expectations of users and changes to the statutory requirements on the level of illumination, the HA has been implementing continuous enhancements to the design of lighting systems. In tandem with technological advancement in lighting industry, steps have been taken to improve safety, achieve energy efficiency and formulate cost effective solutions.

3. To meet the expectation of users and to reduce energy consumption so that quality of living can be upgraded without putting an extra burden on the environment, the HA has enhanced the lighting systems design for domestic buildings' common areas with continuous improvements to the design illumination levels. Details are highlighted below and summarised in **Annex 1**.

(I) Illumination Level

4. We have been upgrading the illumination level for domestic buildings' common areas of public housing. In the past, the illumination level satisfied the minimum safety and security requirements for users. Under the latest standard, the illumination level can facilitate access by people with special needs, in accordance with the requirements of the Design Manual: Barrier Free Access 2008 promulgated by the Buildings Department.

5. Since December 2008, we have also been implementing new lighting control systems in new PRH estates, whereby the illumination level in domestic block common areas will be raised after being triggered automatically by users entering the area or by pressing a button. In so doing, energy can be saved when the illumination level is maintained at a lower level. Details have been set out in our paper CB(1)1909/09-10(01).

(II) *Lighting Fittings*

6. In order to ease maintenance concerns arising from the need to keep numerous types of spare parts and lamps for future replacement, a common type of bulkhead lighting fitting is now used to serve the communal areas in domestic buildings. By using such standard fittings, we can achieve cost saving through bulk purchasing and economies of scale.

7. The lamp types used for general lighting have evolved from the incandescent lamps, to the twin miniature fluorescent lamps used during the 80's, and more recently to the use of compact fluorescent lamps in the latest design. In addition, T5 fluorescent lamps have also been adopted in ground floor lobbies, plant rooms and estate management offices.

8. LED lights are becoming more popular due to the potential merits of luminous efficacy, longer life and environmental-friendliness. We have implemented some small scale pilot installations of lighting with LED as lamp source. The preliminary results are set out in **Annex 2**. We will continue to assess the suitability of LED lights for use in PRH estates.

(III) *Energy Consumption*

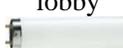
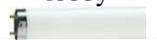
9. The annual electricity consumption for lighting in domestic buildings' common areas accounts for approximately 50% of the total landlord's services electricity consumption. Through continuous review and improvement in the lighting design, we have achieved remarkable energy saving in the public area of PRH estates over the past decades.

Way Forward

10. We will continue to explore the broader use of energy efficient lighting fittings and lighting systems design in PRH estates. Members are invited to note the continuous improvement in lighting system design in PRH estates.

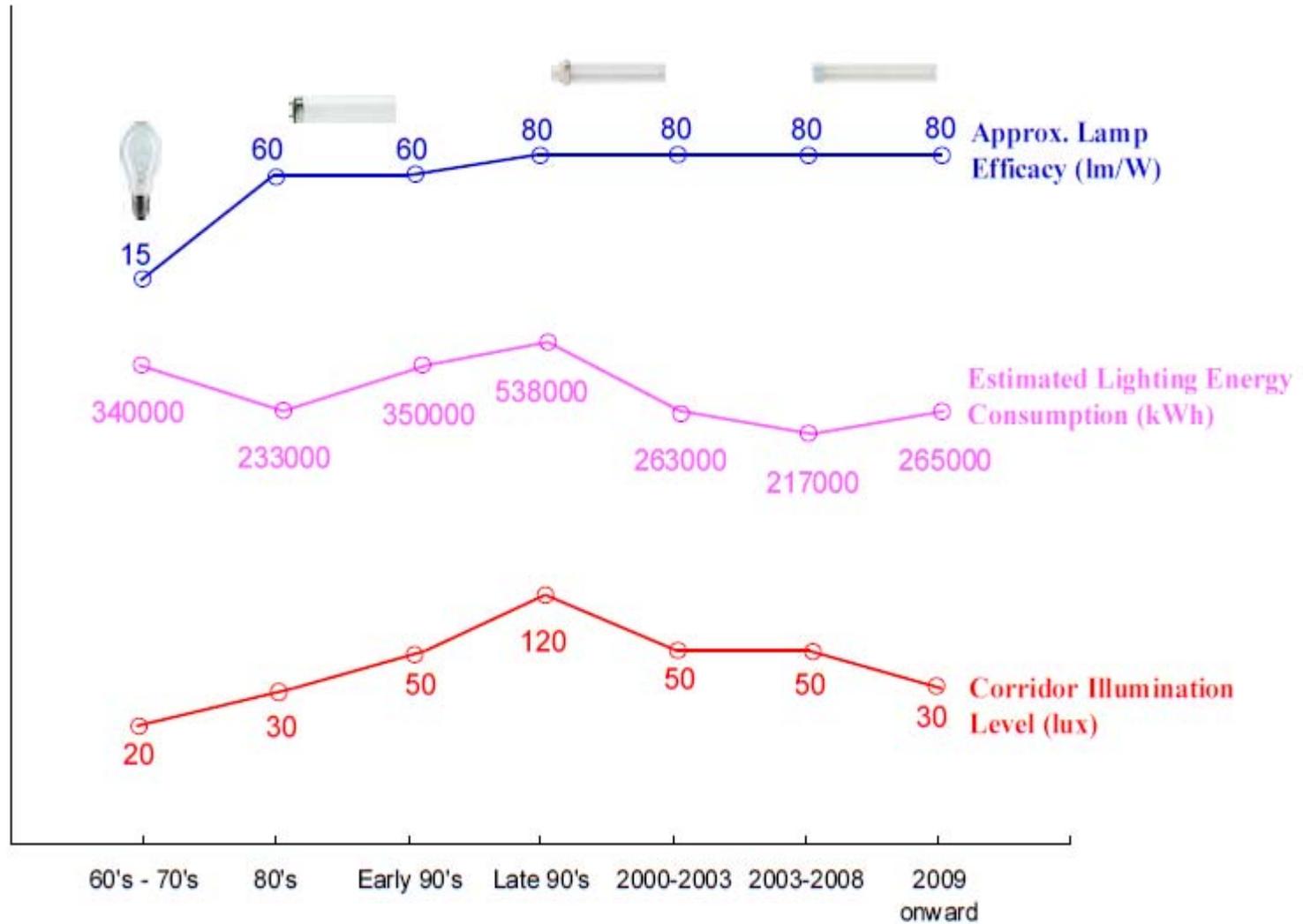
Transport and Housing Bureau
May 2010

Annex 1

(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)
Lamp type		Incandescent lamps for typical floors 	Mini fluorescent lamps for typical floors 	Mini fluorescent lamps for typical floors 	Compact fluorescent lamps with electromagnetic ballasts for typical floors 		Compact fluorescent lamps with electronic ballasts for typical floors 	Compact fluorescent lamps with electronic ballasts for typical floors 
		T12 fluorescent lamps for ground floor (G/F) lobby 	T12 fluorescent lamps for G/F lobby 	T8 fluorescent lamps for G/F lobby 	T8 fluorescent lamps for G/F lobby 		T8 fluorescent lamps for G/F lobby 	T5 fluorescent lamps for G/F lobby 
Year		60's – 70's	80's	Early 90's	Late 90's	2000 – 2003	2003 – 2008	2009 onward
Illumination level	Lift lobbies	< 20 lux	30 lux	85 lux	150 lux ^(Note 1)	85 lux ^(Note 2)	85 lux	50 lux ^(Note 3)
	Corridors	< 20 lux	30 lux	50 lux	120 lux ^(Note 1)	50 lux ^(Note 2)	50 lux	30 lux ^(Note 3)
	Staircases	< 20 lux	30 lux	45 lux	120 lux ^(Note 1)	40 lux ^(Note 2)	40 lux	30 lux ^(Note 3)
Estimated energy (kWh) consumed by lighting per block ^(Note 4)		340 000	233 000	350 000	538 000	263 000	217 000	265 000

- Note 1 : The illumination level was upgraded according to the recommendation stipulated in the Design Manual: Barrier Free Access 1997 issued by the Buildings Department.
- Note 2 : When the buildings with the illumination level as shown in column (5) were gradually put into operation, numerous feedbacks were received commenting that the lighting provision was much more than sufficient for the majority of users in public housing. The HA conducted a review on the acceptable levels of the illumination by surveying the private sector developments and referencing to the latest Chartered Institution of Building Services Engineers Guides and endorsed a set of new illumination levels.
- Note 3 : The illumination level could be increased to 85 lux by manual switch at lift lobby and corridor or motion sensors at staircase, zone by zone, for a period of adjustable time once triggered by users entering the zones.
- Note 4 : The energy consumption is estimated based on a 40-storey, 800 flats cruciform domestic block with the specified lamp types and illumination levels.

Continuous Improvement in Public Rental Housing Lighting Design



Annex 2

Small Scale Trial Installations of LED lights

<u>Project</u>	<u>Brief Description</u>	<u>Photos</u>	<u>Result</u>
Yau Lai Estate	LED lights for entrance hall and conference room of the estate management office		Acceptable; a short warm-up period is required to attain normal illumination level, bluish colour effect and burn-out of some LEDs have been observed.
Wah Lai Estate	Trial installation of different brands of LED bulkhead light fittings in corridors on typical floors		One brand with light output depreciated more than 30% in 3 months and was removed. The other 3 brands depreciated by 7% to 12% after 2 to 4 months operation. Long term performance is under monitoring.

<u>Project</u>	<u>Brief Description</u>	<u>Photos</u>	<u>Result</u>
Lam Tin Estate	Standard light boxes at false ceiling incorporated with LED lamp tubes at the corridor and security office inside estate management office.		Performance satisfactory without obvious degradation in the illumination level since operation in November 2009. Long term performance is under monitoring.
	LED floodlights for external signage of estate management office, canopy LED bulkhead light fittings for general illumination and external staircase LED footlights.	 	Performance satisfactory without obvious degradation in the illumination level since operation in November 2009. Long term performance is under monitoring.
Sau Mau Ping Phase (South) Estate	LED lights for external area illumination.	 	Performance under monitoring.