立法會房屋事務委員會
Legislative Council Panel on Housing

租住公共屋邨
住宅大廈公用地方
持續改善之照明系統設計

Continuous Improvement in Lighting System Design for Domestic Buildings' Common Areas in Public Rental Housing Estates

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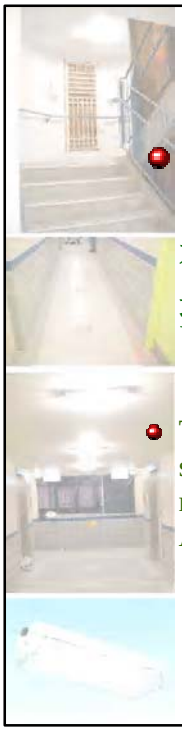

目的 Purpose

- 向議員簡報在香港房屋委員會（下稱「房委會」）興建的租住公共屋邨內，有關住宅大廈公用地方照明系統設計的持續改善情況。

- 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).

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背景 Background

- 多年以來，務求滿足使用者更高的期望和法例對照明光度最新的要求，房委會實施多項措施以持續改善及優化照明系統之設計。配合照明業界的創新發展，採取了相關步伐以改善安全、達致能源效益和制定成本效益的解決辦法。
- 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.

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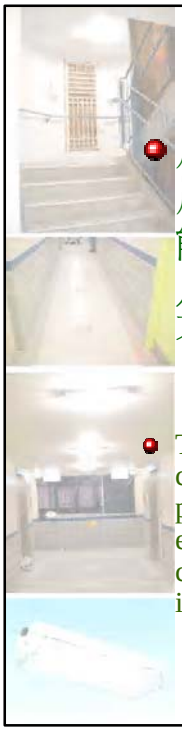

背景 Background

- 房委會一向致力優化公共屋邨住宅大廈公用地方的照明系統設計，並同時兼顧節約能源，持續改善設計照明光度，務求在滿足使用者的期望及提升生活質素之餘，亦不會對環境帶來額外影響。
- 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.

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照明光度 Illumination Level

	房委會的標準 (60年代-70年代) HA Standard in 1960s – 1970s
升降機大堂 Lift lobbies	< 20 勒克斯 (lux)
走廊Corridors	< 20 勒克斯 (lux)
樓梯 Staircases	< 20 勒克斯 (lux)

照明光度只能達致使用者最低限度的安全和保安要求

Illumination level just satisfied the minimum safety and security requirements for users

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照明光度 Illumination Level

	房委會的標準 (80年代) HA Standard in 1980s	房委會的標準 (90年代初期) HA Standard in early 90's
升降機大堂 Lift lobbies	30 勒克斯 (lux)	85 勒克斯 (lux)
走廊 Corridors	30 勒克斯 (lux)	50 勒克斯 (lux)
樓梯 Staircases	30 勒克斯 (lux)	45 勒克斯 (lux)

80年代在公用地方之照明光度約爲30勒克斯

In the 80's, the illumination level for internal public areas was around 30 lux.

90年代初期，房委會改善各公用地方之設計照明光度

In the early 90's, the HA improved the design illumination levels at various public areas.

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照明光度Illumination Level

	房委會的標準 (90年代後期) HA Standard in late 1990s
升降機大堂 Lift lobbies	150 勒克斯 (lux)
走廊 Corridors	120 勒克斯 (lux)
樓梯 Staircases	120 勒克斯 (lux)

90年代後期參照屋宇署發出的《設計手冊：暢通無阻的通道1997》所載建議增強照明光度。

In late 90's, the illumination level was upgraded to match with the recommendation of the **Design Manual – Barrier Free Access 1997** promulgated by the Buildings Department.

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照明光度Illumination Level

	房委會的標準 (90年代後期) HA Standard in late 1990s	房委會的標準 (2000年-2008年) HA Standard (2000 - 2008)
升降機大堂 Lift lobbies	150 勒克斯 (lux)	85 勒克斯 (lux)
走廊 Corridors	120 勒克斯 (lux)	50 勒克斯 (lux)
樓梯 Staircases	120 勒克斯 (lux)	40 勒克斯 (lux)

當採納90年代後期照明光度的大廈逐步入伙後，收到很多意見，指對大多數公屋用戶而言，照明裝置過多。

When lighting at those buildings using the 90's standard were put into operation, there were comments from users that the lighting provision was more than sufficient

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照明光度Illumination Level

	房委會的標準 (90年代後期) HA Standard (Late 90's)	房委會的標準 (2000年-2008年) HA Standard (2000 - 2008)
升降機大堂 Lift lobbies	150 勒克斯 (lux)	85 勒克斯 (lux)
走廊 Corridors	120 勒克斯 (lux)	50 勒克斯 (lux)
樓梯 Staircases	120 勒克斯 (lux)	40 勒克斯 (lux)

房委會就可接受的照明光度進行檢討，包括調查私人機構發展項目的情況，並參照最新的《英國特許屋宇裝備工程師學會指引》，然後通過一套新的照明光度，於2000年至2008年間採用。

HA conducted a review of the acceptable illumination levels by surveying the private developments and making reference to the latest CIBSE Guides. A new standard on illumination levels was established and adopted in new development during 2000 - 2008.

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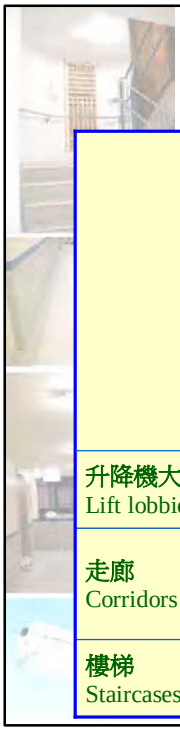

照明光度Illumination Level

(Standard revised Since 2009)

	房委會的標準 (2009年起) HA Standard (2009 onward)	
	基本照明光度 Basic illumination level	提升之照明光度 Raised illumination level
升降機大堂 Lift lobbies	50 勒克斯 (lux)	85 勒克斯 (lux)
走廊 Corridors	30 勒克斯 (lux)	85 勒克斯 (lux)
樓梯 Staircases	30 勒克斯 (lux)	85 勒克斯 (lux)

- 屋宇署在2008年公布的《設計手冊：暢通無阻的通道2008》提升有關照明光度標準至85勒克斯，以便利有特別需要人士往返通行之用。我們採用文件CB(1)1909/09-10(01)闡述的創新照明控制系統。。
- The latest Design Manual: Barrier Free Access promulgated by the Building Department requires a raised lighting level to 85 lux to facilitate people with special needs. An innovative design was implemented as detailed in paper CB(1)1909/09-10(01).

由控制鈕啓動
Activated by manual switches

由移動感應啓動
Activated by motion sensors

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燈具 Lighting Fittings

屋邨住宅大廈的公用地方，現時均選用一種裝置有小型慳電光管的照明燈具。

優點包括：

- 無須存放大量不同種類的燈管及零件以供日後更換，方便維修保養。
- 採用統一規格的燈具，我們可以藉著大量採購而達致節省成本及經濟原則。

A common type of bulkhead lighting fitting is chosen to serve the communal areas in domestic buildings.

Advantages:
– To ease maintenance concern on keeping numerous types of spare parts and lamps for future replacement.
– Achieve cost saving through bulk purchasing and economies of scale.

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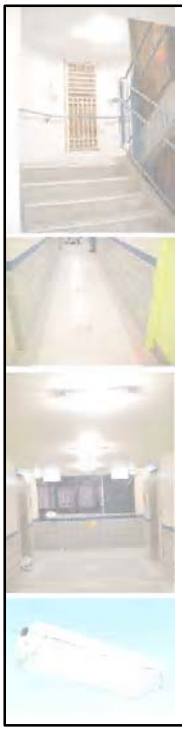
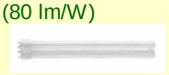


燈具 Lighting Fittings

年份 Year	60年代 – 70年代 60's – 70's	80年代 80's	90年代初期 Early 90's
燈種 **Lamp type**	標準樓層 鎢絲燈 Incandescent lamps for typical floors (15流明／瓦特) (15 lm/W)  地下大堂 T12 光管 T12 fluorescent lamps for G/F lobby 	標準樓層 小型光管 Mini fluorescent lamps for typical floors (60流明／瓦特) (60lm/W) 地下大堂 T12 光管 T12 fluorescent lamps for G/F lobby 	標準樓層 小型光管 Mini fluorescent lamps for typical floors (60流明／瓦特) (60 lm/W) 地下大堂 T8 光管 T8 fluorescent lamps for G/F lobby 

燈具 Lighting Fittings

年份 Year	90年代後期 至2002年 Late 90's - 2002	2003年 – 2008年 2003 - 2008	2009年起 2009 onward
燈種 **Lamp type**	標準樓層小型慳電光管連電感式鎮流器 Compact fluorescent lamps with electromagnetic ballast for typical floors (80流明／瓦特) (80 lm/W)  地下大堂T8光管 T8 fluorescent lamps for G/F lobby 	標準樓層小型慳電光管連電子鎮流器 Compact fluorescent lamps with electronic ballast for typical floors (80流明／瓦特) (80 lm/W)  地下大堂T8光管 T8 fluorescent lamps for G/F lobby 	標準樓層小型慳電光管連電子鎮流器 Compact fluorescent lamps with electronic ballast for typical floors (80流明／瓦特) (80 lm/W)  地下大堂T5光管 T5 fluorescent lamps for G/F lobby

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燈具 Lighting Fittings

- LED lights are becoming more popular due to the potential merits in luminous efficacy, longer life and environmental friendliness.
- LED照明具有多項潛在優點，包括高發光效率、壽命較長，以及較爲環保，因此預期會日漸普及。

小規模設有LED作爲燈源的室內照明裝置
Small scale pilot installations for internal area:


油麗邨入口大堂及屋邨管理處會議室

Entrance hall and conference room of the estate management office of Yau Lai Estate

華荔邨標準樓層走廊

Corridor at a domestic floor of Wah Lai Estate

藍田邨屋邨管理處走廊

Corridor inside estate management office of Lam Tin Estate

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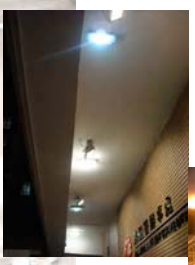
燈具 Lighting Fittings

- 小規模設有LED作爲燈源的室外照明裝置
- Small scale pilot installations for external area:



屋邨管理處外部標誌以LED泛光燈照明、簷篷之一般照明則採用LED凸面照明燈具
Floodlights for external signage of estate management office and bulkhead light fittings at canopy for general illumination

地腳燈 Footlights

秀茂坪（南）邨戶外地方照明
External area illumination at
Sau Mau Ping (South) Estate

藍田邨
Lam Tin Estate

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燈具 Lighting Fittings

- 小規模安裝設有LED作爲燈源的照明裝置運作狀況初步報告：
  - 部份LED照明燈具的光照度漸漸減退7%至12%不等，部份更在兩至三個月減逾30%。
  - 一些LED照明燈具出現藍光效應，甚至燒壞。
  - 一些LED照明燈具照明度沒有明顯減退。
- 除了節能外，亦會監察及評核有關LED照明裝置長期運作的折舊及耐用性。
- Preliminary result of small scale pilot LED installations:
  - Light output for some LED lights depreciated gradually by 7% - 12% but some rapidly by 30% within 2 – 3 months.
  - Some LEDs changed to bluish colour or burn-out.
  - Some LED lights maintain stable performance.
- Long term benefits will be further evaluated with reference to not just energy saving but also depreciation and endurance

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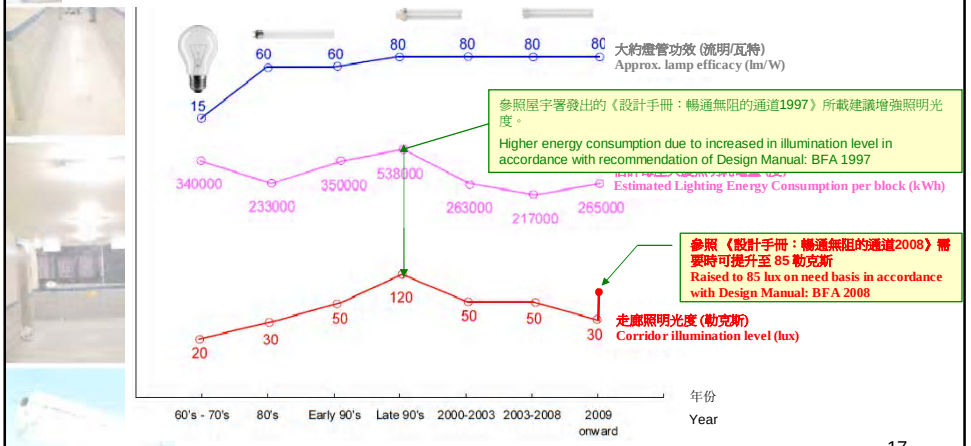
耗電量 Energy Consumption

- 假設基於一座樓高40層和有800個單位之十字型住宅大廈於不同時期所採用之燈種及照明光度而估計之年均照明耗電量。
- Estimated annual electricity consumption for lighting basing on a 40-storey, 800 flats cruciform domestic block at different stages using different lamp types and illumination levels.



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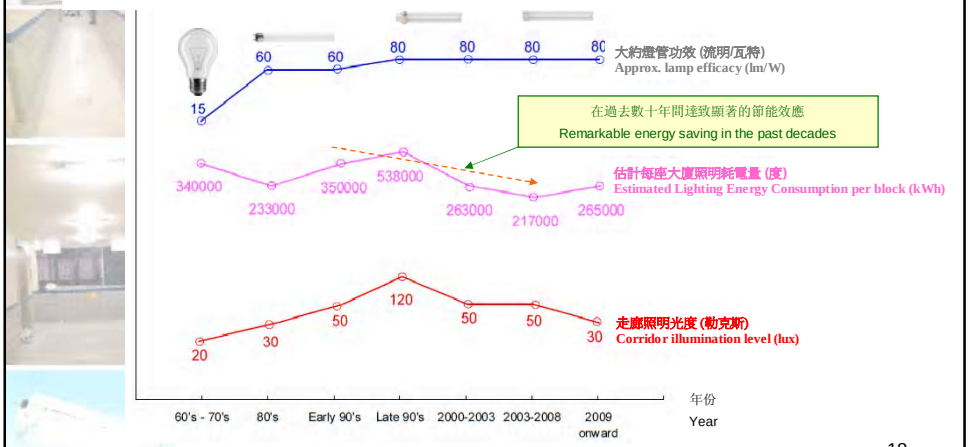

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耗電量 Energy Consumption

- 就根據房委會2003年至2008年11月照明標準及最新照明標準設計之照明系統估計耗電量比較如下：
- Comparison of the energy consumption in the latest lighting design with those between 2003 and November 2008:

	房委會的標準 (2003年至2008年11月) HA Standard (2003 to November 2008)	符合設計手冊：暢通無阻的通道《2008》規定 To meet Design Manual: Barrier Free Access 2008 requirement	符合設計手冊：暢通無阻的通道《2008》規定及採用新照明控制 To meet Design Manual: Barrier Free Access 2008 requirement using new lighting control
樓上升降機大堂 Lift lobby of upper floors	**85 勒克斯** (lux)	**85 勒克斯** (lux)	**50 / 85 勒克斯** (lux)
走廊 Corridor	**50 勒克斯** (lux)	**85 勒克斯** (lux)	**30 / 85 勒克斯** (lux)
樓梯 Staircases	**40 勒克斯** (lux)	**85 勒克斯** (lux)	**30 / 85 勒克斯** (lux)
估計之耗電量 Estimated energy consumption	**217,000 度/大廈** **217,000 kWh/Block**	**386,000 度/大廈** (沒有實施新的照明控制) **386,000 kWh/Block** (without new lighting control)	**265,000度/大廈** (預計耗電量) **198,000 度/大廈** (最低耗電量) **386,000 度/大廈** (最高耗電量) **265,000 kWH/Block** (Estimate Consumption) **198,000 kWH/Block** (Minimum energy consumption) **386,000 kWh/Block**(Maximum energy consumption)

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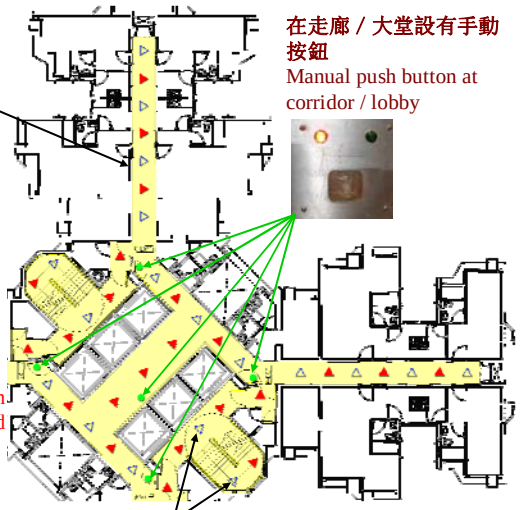
在每個住宅單位的大門電話對講系統設有照明系統按鈕
Designated button on the door phone handset inside each flat

在走廊 / 大堂設有手動按鈕
Manual push button at corridor / lobby



圖例 Legend

手動按鈕 Manual Push Button

長明系統 (Duty Set)
在走廊和樓梯提供30勒克斯和在升降機大堂提供50勒克斯基本光度的照明系統
Light fitting to provide basic illumination level of 30 lux for typical corridor and staircase and 50 lux for typical lift lobby

備用系統 (Standby Set)
把光度提升至85勒克斯的照明系統
Light fitting to elevate the illumination to 85 lux

在樓梯設有動作感應器
Motion sensor at staircase landing

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操作方法 Operation

居民乘搭升降機回單位

Tenants go back to their flats

1. 居民步出升降機前往住宅單位時，可按下升降機大堂的手動按鈕以開啓升降機大堂區域的備用照明系統。

For tenants coming out from lifts on their way to domestic flats, they can press the manual switch in the lift lobby to turn on the standby lightings in the lift lobby area.

2. 然後在走廊入口處按下另一手動按鈕，啓動走廊的備用照明系統。

Then press another manual switch at the entrance of corridor to turn on the standby lighting in the corridor.

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操作方法 Operation

居民從單位出外

Tenants leave their flats

在每個住宅單位的大門電話對講系統設有照明系統按鈕離開住宅單位時，可在單位內按下大門電話對講系統的指定按鈕，開啓有關走廊和升降機大堂的備用照明系統

For tenants leaving domestic flats, they can turn on the standby lighting of the corresponding corridor and lift lobby by pressing a designated push button on the door phone handset inside the domestic flats.

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操作方法 Operation

居民經樓梯往另一樓層

Tenants go to another floor vide staircase

1. 居民步入樓梯時，在樓梯內的動作感應器探測到有人進入時，便會自動開啓相關的樓梯照明備用系統。

For tenants enter staircases, motion sensors inside the staircases will turn on the standby lighting fittings upon when detecting any persons entering the staircases.

2. 居民步出樓梯時，可按下裝設在各樓梯入口處的手動按鈕，開啓備用系統以便在到達有關住宅單位前沿途獲得充足照明。

Tenants come out from staircases can press the manual switch installed at each staircase entrance to turn on the necessary lighting on their way to the designated domestic flats.

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未來路向 Way Forward

- 作為一個以關懷為本的機構，房委會將繼續研究在公共屋邨更廣泛採用各種節能照明燈具及照明系統設計。
- As a caring organization, we will continue to explore the broader use of energy efficient lighting fittings and lighting system design in PRH estates.

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謝 謝

Thank You

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