

《建築物能源效益條例草案》
當局對二零一零年三月十一日法案委員會會議
跟進事項的回應

“工業建築物”的定義

《建築物能源效益條例草案》(條例草案)中“工業建築物”的定義是參考了“工業建築物”一詞於《建築物(垃圾及物料回收房及垃圾槽)規例》(第123章附屬法例H)的定義。條例草案採用的定義載列如下——

“工業建築物”指——

- (a) 內有以下工序進行的建築物——
 - (i) 物品的生產、更改、潔淨、修理、裝飾、表面修飾、出售前改裝、拆解或拆除；或
 - (ii) 物料轉化；或
- (b) 貨倉。

法案委員會的委員詢問政府當局不採納《土地(為重新發展而強制售賣)(指明較低百分比)公告》(公告)中有關“工業建築物”定義的原因。公告中採用的定義載列如下——

“工業建築物”指符合以下描述的建築物：該建築物的全部或部分，經建築事務監督按根據《建築物條例》(第123章)批准的某份圖則，批准用作任何以下用途——

- (a) 貨倉；
- (b) 任何內有物品的製造、更改、清洗、修理、裝飾、精加工、出售前改裝、搗碎或拆除進行的工業，或內有物料的改變進行的工業。

2. 正如立法會CB(1)1378/09-10(01)號文件所述，公告的政策原意不單要涵蓋位處非工業地帶的樓齡達30年或以上並

仍在使用的工業大廈，同時亦包括使用率偏低或已空置的工業大廈。因此，公告中“工業建築物”的定義，繫於經建築事務監督根據《建築物條例》批准的有關樓宇建築圖則。公告採用的定義是考慮了有關的政策原意。

3. 而就條例草案，我們建議工業建築物只涵蓋其公用地方。有關安排是考慮到個別工業工序可能有其特殊的能源要求，而就不同工業工序訂立廣義的能源效益標準是十分困難的。為獲得更大的環保效益，仍在使用的工業大廈將被視作“工業建築物”。我們認為現時建議的定義能適當地反映我們的政策意向。

“公用地方”的定義

4. 條例草案中“公用地方”就訂明建築物而言 —
- (a) 指該建築物的任何地方，但在土地註冊處註冊的文書中指明為專供擁有人使用、佔用或享用的部分除外；及
 - (b) 在不局限(a)段的原則下，包括停車場、入口大堂、升降機大堂、走廊、樓梯、公用洗手間、公用貯物室、機房、電掣房、喉管井道、電纜管道、垃圾房、物料回收房、有蓋平台、有蓋遊樂場、住客會所及建築物管理處。
5. 定義的(a)段反映我們的政策意向，即除了在土地註冊處註冊的文書中指明為專供擁有人使用、佔用或享用的部分外，訂明建築物的所有地方，皆應被涵蓋於“公用地方”的定義內。定義的(b)段列舉了在一般建築物中常見的“公用地方”，以方便參考。律政司認為，在(b)段採用“在不局限(a)段的原則下，包括”這詞組已明確表達(b)段須在(a)段的原則下理解，並解釋(b)段旨在提供例子，以更詳細解釋主要條文。如果將(b)段作獨立理解，即會局限(a)段的涵蓋範圍。如在(b)段列舉的地方已在土地註冊處註冊的文書中指明為專供擁有人使用、佔用或享用，有關地方將不會被視作訂明建築物的“公用地方”。

6. “公用地方”的建議定義是參考了《建築物管理條例》(第344章)中“公用部分”的定義。

第8至13條的涵蓋及適用範圍

7. 條例草案第8至13條所施加的責任，適用於在條例草案第2部生效日期之後獲發上蓋建築物建築工程展開同意書的訂明建築物。條例草案第8至13條的涵蓋及適用範圍大綱圖見附件A。

條例草案第12條的責任

8. 條例草案第12條規定，建築物擁有人及建築物的單位負責人須確保其中央屋宇裝備裝置及其他屋宇裝備裝置被維持在某一標準。我們的政策原意是為避免屋宇裝備裝置其後被更改或替換較低能源效益的組件，並確保有關裝置能得到妥善保養，以避免能源效益過度下降。

9. 《建築物能源效益守則》的指明標準是就裝置設計參數訂立的標準及要求，有關的標準及要求不涉及裝置的日常運作表現。一般情況下，裝置若得到妥善保養，其正常損耗對它的能源效益表現不應有重大影響。建築物擁有人及負責人可在更換設備或進行合適保養時參閱裝置的產品目錄，或在有任何疑問時，諮詢合資格人士的意見。機電工程署亦會擬備簡明的指引，以協助擁有人和負責人遵行有關規定。

10. 條例草案第12條亦規定建築物的擁有人須確保該建築物擁有有效的遵行規定登記證明書。由於第10(4)條已訂明遵行規定登記證明書的有效期為10年，第12(1)條的政策原意是為確保遵行規定登記證明書能被適時續期。因應法案委員會的意見，我們建議修訂第12(1)條，以清楚訂明有關責任適用於已獲發遵行規定登記證明書的建築物擁有人。

固定電力裝置的定期檢查、測試及發出證明書

11. 根據《電力(線路)規例》(第406附屬法例E章)第20條，低壓固定電力裝置的擁有人，須安排該裝置每5年最少

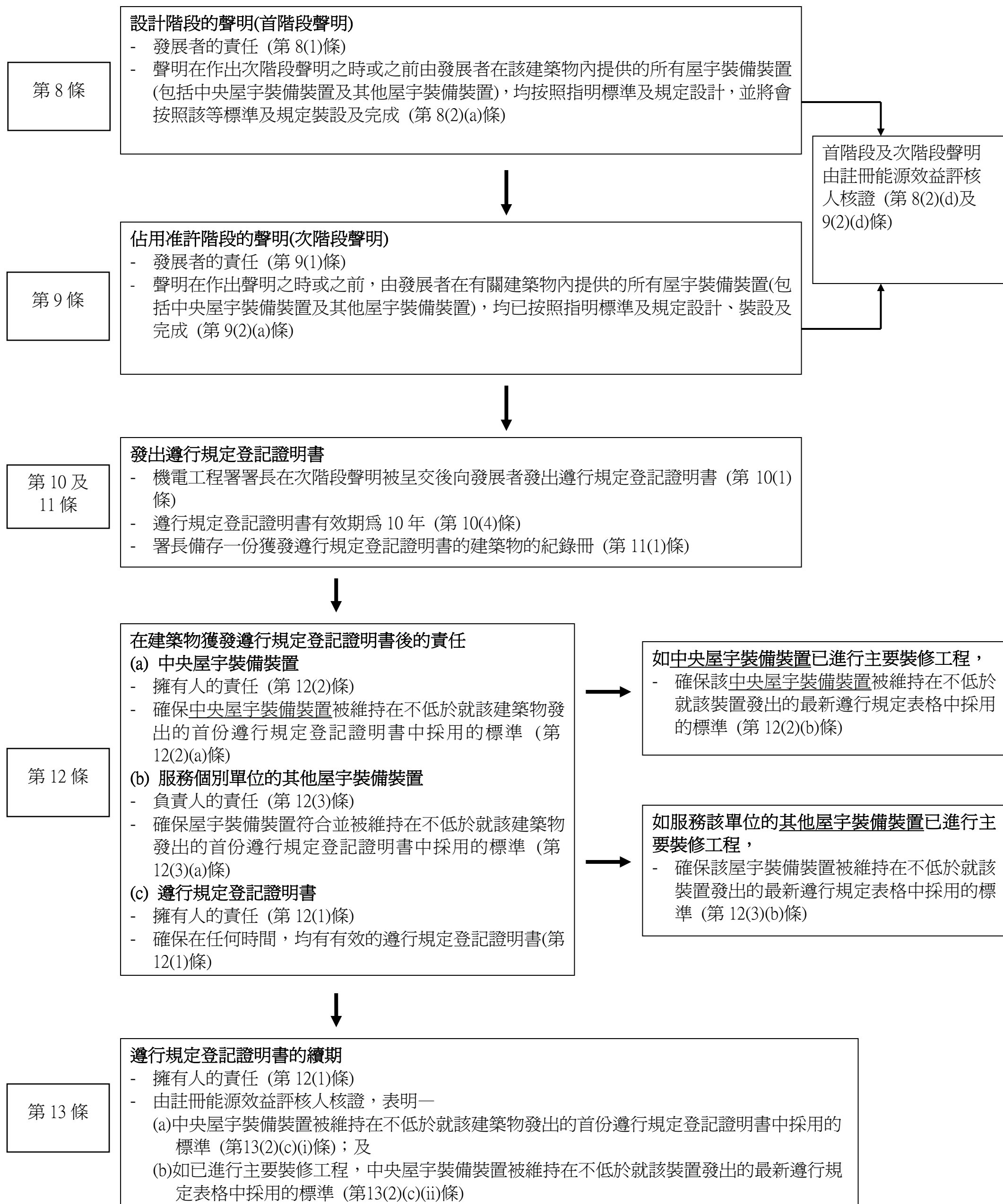
作一次檢查、測試及領取證明書。我們亦於條例草案第13條，就遵行規定登記證明書的續期訂定相若的規定。有關規定旨在核證訂明建築物的中央屋宇裝備裝置能維持在某一標準。就遵行規定登記證明書建議的10年續期規定，是參考了屋宇裝備裝置的壽命及擁有人遵行規定的負擔。我們認為有關的建議合適。

技術表格的草擬本

12. 技術表格的草擬本(英文版本)分別載於附件B至F。有關表格是為提交次階段聲明及遵行規定表格，以及申請遵行規定登記證明書的續期時須提供的補充資料。我們將為技術表格準備中文版本。

環境局
機電工程署
二零一零年三月

第 8 至 13 條的涵蓋及適用範圍
(適用於條例生效後建築物¹)



¹ 條例生效後建築物是指於新法例生效日期後, 獲建築事務監督發出有關上蓋建築物的建築工程展開同意書的建築物。

Technical Data of Lighting Installation

Form EE-LG

For substantiation of compliance with Section 5 of COP in Energy Efficiency of BS Installations in Buildings (BEC)

Lighting Installations Summary	Part 1
Name of Building : _____	
Registered Energy Assessor :	
Name: _____ Registration No: _____	
Submission Date: _____ Signature: _____	
Lighting Load Total area with fixed lighting installations (m ²) : _____ Total Installed lighting power (kW) : _____	
Submitted Forms, Drawings, Catalogues etc. (tick where applicable)	
Submittal	No. of Sheets
<input type="checkbox"/> Form EE-LG Part 1 (Lighting Installations Summary)	
<input type="checkbox"/> Form EE-LG Part 2 (Lighting Power Density Worksheet)	
<input type="checkbox"/> Drawings to show lighting layouts (for the luminaires contributing to the LPD in Part 2 of this form) in various lighting spaces <input type="checkbox"/> A drawing summary list to indicate the drawing title and number.	
<input type="checkbox"/> Technical brochures / catalogues (for the luminaires contributing to the LPD in Part 2 of this form), substantiating the circuit wattage of each luminaire <input type="checkbox"/> A brochures/catalogues summary list indicating their titles and corresponding luminaires	
<input type="checkbox"/> Others (to give details) _____	
Remarks:- <ul style="list-style-type: none"> ◆ Total Installed Lighting Power refers to the sum of circuit wattage (i.e. lamp wattage plus lamp control gear loss) of all luminaires included in the calculation of lighting power density. (Calculation details should be properly filed for ready retrieval for inspection) ◆ Lighting layouts should show : <ul style="list-style-type: none"> ▫ for each space the positions of luminaires; ▫ for each office space the no. of luminaires controlled by each lighting control point; ▫ a summary of the different types of luminaires, with a brief description of each luminaire type, including <ul style="list-style-type: none"> - circuit wattage, - no. of lamps per luminaire, and - type of lamp including T5 tubular fluorescent, T8 tubular fluorescent, compact fluorescent, metal halide, light emitting diode, high pressure sodium, tungsten halogen etc. 	

Technical Data of Lighting Installation

For substantiation of compliance with Section 5 of COP in Energy Efficiency of BS Installations in Buildings (BEC)

Lighting Power Density							Part 2
Designation			Area (m ²)	Lighting Power Density (LPD) (W/m ²)			No. of control points ^{*4} for office
Block	Floor	Name of Space		Type of Space ^{*1}	General lighting ^{*2}	Decorative lighting ^{*3}	
Remarks:- ^{*1} To insert the type of space per categorization in Table 5.4 of the BEC. ^{*2} Calculated LPD of general lighting that provides a substantially uniform level of illumination throughout and maintained type emergency lighting. ^{*3} Calculated LPD of general lighting included in the installations specified in clause 6(a) of Schedule 2 of the Ordinance (solely used for Decoration / Visual Production / Illumination of an Exhibit or Product on Display). ^{*4} Figure to be inserted only for a space classified as an office. ^{*2 *3} The LPD for General lighting has to comply with the corresponding requirement in Table 5.4 of this BEC. LPD for display lighting, decorative lighting and visual production lighting are to be provided to EMSD for information only. Please insert more rows where applicable, for all the relevant spaces in the building.							

Technical Data of Air Conditioning Installation

Form EE-AC

For substantiation of compliance with Section 6 of COP in Energy Efficiency of BS Installations in Buildings (BEC)

AC Installations Summary		Part 1
Name of Building : _____		
Registered Energy Assessor :		
Name: _____ Registration No: _____		
Submission Date: _____ Signature: _____		
AC Load	Conditioned Area (m ²) _____	
Calculated Block Cooling Load (kW) _____	Installed Total Plant Capacity (kW) _____	
Calculation Method : <input type="checkbox"/> ASHRAE <input type="checkbox"/> CIBSE <input type="checkbox"/> Others _____ (Please specify) (tick where applicable) Note : Calculation details should be properly filed for ready retrieval.		
Submitted AC Forms, Drawings, Catalogues etc. (tick where applicable)		
Submittal	No. of Sheets	
<input type="checkbox"/> Form EE-AC Part 1 (AC Installation Summary)		
<input type="checkbox"/> Form EE-AC Part 2 (Design Parameters Worksheet)		
<input type="checkbox"/> Form EE-AC Part 3 (AC Systems and Controls Worksheet)		
<input type="checkbox"/> Form EE-AC Part 4 (Air Duct Leakage Test Worksheet)		
<input type="checkbox"/> Form EE-AC Part 5 (AC Equipment Efficiency Worksheet)		
<input type="checkbox"/> Form EE-AC Part 6 (Fan Motor Power Worksheet)		
<input type="checkbox"/> Drawings to show the water-side and air-side distribution schematics		
<input type="checkbox"/> A drawings summary list to indicate the drawing titles and number.		
<input type="checkbox"/> Technical brochures / catalogues (for power rating and efficiency of the equipments submitted in the Form)		
<input type="checkbox"/> A brochures / catalogues summary list to indicates the type of equipment.		
<input type="checkbox"/> Others (to give details) _____		

Technical Data of Air Conditioning Installation

Form EE-AC

For substantiation of compliance with Section 6 of COP in Energy Efficiency of BS Installations in Buildings (BEC)

Design Parameters Worksheet			Part 2	
Part (A) : Outdoor Design Conditions				
Summer		Winter		
Design d.b. Temp. °C	Design R.H. %	Design d.b. Temp. °C	Design R.H. %	
Part (B) : Indoor Design Conditions				
Applications/Zone Ref. (e.g. Offices, shops etc.)	Summer		Winter	
	Design d.b. Temp. °C	Design R.H. %	Design d.b. Temp. °C	Design R.H. %
Note : Design condition of each typical application/zone should be given. If different design conditions are adopted for the same type of application, these conditions should be given with different zone ref.				

Design Parameters Worksheet			Part 2	
Part (C) : Friction Loss				
System Ref. No.	Piping System Description		Friction Loss (Pa/m)	
Primary chilled water				
Secondary chilled water				
Condenser water				
Part (D) : Insulation				

AC Systems and Controls Worksheet		Part 3
Part (D) : Temperature Control		
Each AC system is provided with at least one automatic control device for regulation of temperature?		
<input type="checkbox"/> Yes		<input type="checkbox"/> No
Thermostatic controls for comfort cooling are capable of adjusting the set point up to 29°C?		
<input type="checkbox"/> Yes		<input type="checkbox"/> No
Thermostatic controls for comfort heating are capable of adjusting the set point down to 16°C?		
<input type="checkbox"/> Yes		<input type="checkbox"/> No
Thermostatic controls for both comfort cooling and heating are capable of providing a temperature range or dead band of at least 2°C?		
<input type="checkbox"/> Yes	<input type="checkbox"/> No Exceptions : Thermostats requiring manual changeover? <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Not Applicable
Part (E) : Humidity Control		
Any humidifier or dehumidifier installed for maintaining specific humidity level?		
<input type="checkbox"/> Yes Zone Ref. _____		<input type="checkbox"/> No
Humidistat provided for the above purpose?		
<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Humidistat capable of preventing the humidifier to increase RH above 30% ?		
<input type="checkbox"/> Yes	<input type="checkbox"/> No	
Humidistat capable of preventing the dehumidifier to decrease RH below 60% ?		
<input type="checkbox"/> Yes	<input type="checkbox"/> No	

Technical Data of Air Conditioning Installation

Form EE-AC

For substantiation of compliance with Section 6 of COP in Energy Efficiency of BS Installations in Buildings (BEC)

Air Duct Leakage Test Worksheet			Part 4
Test Section : _____	Drawing No. : _____		
Total Surface Area of Tested Ducts			
Width and depth or diameter (mm)	Periphery (mm)	Length (m)	Area (m ²)
Total			
Design Data			
Total duct surface area (m ²)			
Total surface area under test (m ²)		[From above table]	
Duct operating static pressure - ρ (Pa)			
Air leakage class			
Air leakage limit (L/s per m ²)			
Maximum permitted leakage (L/s)			
Test Records Summary			
Date of test			
Duct static pressure reading (Pa)			
Duration of test (min)		[Not less than 10 minutes]	

Technical Data of Air Conditioning Installation

For substantiation of compliance with Section 6 of COP in Energy Efficiency of BS Installations in Buildings (BEC)

AC Equipment Efficiency Worksheet										Part 5	
Equipment Ref. No.	Unit Type	Quantity (No.)	Rated Capacity (kW)	Total Rated Capacity (kW)	Equipment Efficiency					Rating Standard of COP & PLV (to state standard (such as ARI), or other standards with details *)	Accredited Body (such as ARI)
					Rated COP at 100% load	Required COP (for office use)	Rated PLV (to be provided for equipment above 10kW)				
							75% load	50% load	25% load		
Total					* details to include as appropriate: condenser water entering temperature, water flow rate & fouling factor, condenser entering air conditions, evaporator water leaving temperature, flow rate & fouling factor, refrigerant saturated discharge temperature & liquid temperature etc.						

Technical Data of Air Conditioning Installation

For substantiation of compliance with Section 6 of COP in Energy Efficiency of BS Installations in Buildings (BEC)

Fan Motor Power Worksheet															Part 6	
<input type="checkbox"/> Constant Air Volume System <input type="checkbox"/> Variable Air Volume System																
System Ref. No.	Supply Air (L/s)	Supply Fan			Return Fan			Pre-treated Air Fan				Exhaust Fan				Total fan motor power (kW)
		FSP _s (kW)	η _m	η _d	FSP _r (kW)	η _m	η _d	FSP _p (kW)	η _m	η _d	ℜ _p	FSP _e (kW)	η _m	η _d	ℜ _e	
Total Q		Total P _T														
Notes : Q - Air flow rate (L/s) FSP _x - Fan shaft power or fan brake power of respective motor in kW. η _m - Motor efficiency of respective motor. η _d - Drive/belt efficiency of respective fan drive. ℜ _p - Ratio of pre-treated air quantity supplied to the fan system to the total air quantity handled by the pre-treated air fan. ℜ _e - Ratio of exhausted air quantity extracted from the fan system to the total air quantity handled by the exhaust fan. P _T = Total fan motor power in kW = FSP _s /(η _m × η _d) + FSP _r /(η _m × η _d) + (FSP _p × ℜ _p)/(η _m × η _d) + (FSP _e × ℜ _e)/(η _m × η _d). P _f = Total fan motor power for air treatment/filtering in kW. <input type="checkbox"/> - Tick where applicable. For exempted systems stipulated in this Code, fans and corresponding motor efficiencies have to be listed. N.A. - Not Applicable.																
Total fan motor power (P _T - P _f) ≥ 5 kW ? [P _f = ___ kW]																
<input type="checkbox"/> If no, <input type="checkbox"/> If yes, then																
<input type="checkbox"/> CAV System (P _T - P _f) × 1000/Q = _____ W per L/s ≤ 1.6 W per L/s																
<input type="checkbox"/> VAV System (P _T - P _f) × 1000/Q = _____ W per L/s ≤ 2.1 W per L/s																

Technical Data of Air Conditioning Installation

Form EE-AC

For substantiation of compliance with Section 6 of COP in Energy Efficiency of BS Installations in Buildings (BEC)

Fan Motor Power Worksheet			Part 6
System Ref. No.:			
Supply Fan Filtering Sys.	Air Flow Rate	V (m^3/s)	
	Clean Air Pressure Drop	P_d (Pa)	
	Fan Efficiency	η_f	
	Motor Efficiency	η_m	
	Drive/Belt Efficiency	η_d	
	Additional Motor Power	P_f (kW)	
Return Fan Filtering Sys.	Air Flow Rate	V (m^3/s)	
	Clean Air Pressure Drop	P_d (Pa)	
	Fan Efficiency	η_f	
	Motor Efficiency	η_m	
	Drive/Belt Efficiency	η_d	
	Additional Motor Power	P_f (kW)	
Pre-treated Air Fan Filtering Sys.	Air Flow Rate	V (m^3/s)	
	Clean Air Pressure Drop	P_d (Pa)	
	Fan Efficiency	η_f	
	Motor Efficiency	η_m	
	Drive/Belt Efficiency	η_d	
	Ratio of pre-treated air quantity supplied to the system to the total air quantity handled by the pre-treated air fan	\mathfrak{R}_p	
	Additional Motor Power	P_f (kW)	
Exhaust Fan Filtering Sys.	Air Flow Rate	V (m^3/s)	
	Clean Air Pressure Drop	P_d (Pa)	
	Fan Efficiency	η_f	
	Motor Efficiency	η_m	
	Drive/Belt Efficiency	η_d	
	Ratio of exhausted air quantity from the system to the total air quantity handled by the exhaust fan	\mathfrak{R}_e	
	Additional Motor Power	P_f (kW)	
Total P_f (kW)			
Notes: $P_f = V \times (P_d - 250) / (\eta_f \times \eta_m \times \eta_d)$. For pre-treated air fan and exhaust fan filtering systems, multiply \mathfrak{R}_p & \mathfrak{R}_e respectively. Total P_f = Sum of the additional motor power of all filtering systems.			

Electrical Installations Summary		Part 1
Name of Building : _____		
Registered Energy Assessor :		
(Name): _____ (Registration No): _____		
(Submission Date): _____ (Signature): _____		
Electrical Load of Tenant : _____ kVA		Electrical Load of Landlord : _____ kVA
Total Electrical Load : _____ kVA		Usable Floor Area : _____ (m ²)
Total Load Density : _____ kVA / m ² usable floor area		
Submitted Forms, Drawings, Catalogues etc. (tick where applicable)		
Submittal	No. of Sheets	
<input type="checkbox"/> FORM EE-EL Part 1: Electrical Installations Summary		
<input type="checkbox"/> FORM EE-EL Part 2 : Electrical Power Distribution Worksheet		
<input type="checkbox"/> FORM EE-EL Part 3 : Electrical Power Utilisation Worksheet		
<input type="checkbox"/> FORM EE-EL Part 4 : Electrical Power Quality Worksheet		
<input type="checkbox"/> FORM EE-EL Part 5 : Electrical Metering & Monitoring Worksheet		
<input type="checkbox"/> Drawings to show the schematics for the Mains, Sub-main, Feeder and Final Circuits in Part 2 of this Form.		
<input type="checkbox"/> A drawings summary list to indicate the drawing title and number.		
<input type="checkbox"/> Technical brochures / catalogues (for the conductor in Part 2 and motor in Part 3), substantiates the copper loss and the motor efficiency.		
<input type="checkbox"/> A brochures / catalogues summary list to indicate their cable/busduct schedule and motor schedule.		
<input type="checkbox"/> Others (to give details) _____		

Electrical Power Distribution Worksheet		Part 2
A. High Voltage Distribution		
The building has more than 50 storeys or over 175m in height above ground ?		<input type="checkbox"/> Yes <input type="checkbox"/> No
Voltage level : _____ kV		
System designed and installed by : <input type="checkbox"/> Utility Company <input type="checkbox"/> Private Consultants and Contractors		
B. Minimum Transformer Efficiency		
Any privately owned distribution transformers used in the building?		
<input type="checkbox"/> Yes, Transformer Rated Capacity : _____ kVA 1-phase/3-phase No. of Transformers : _____ Efficiency at Full Load : _____ %		<input type="checkbox"/> No
C. Location of Distribution Transformers & Main LV Switchboards		
The distribution transformers and main LV switchboards are at their load centres?		
<input type="checkbox"/> Yes Locations : _____	<input type="checkbox"/> No Locations : _____	
D. Main Circuits		
The transformer rooms and main LV switchrooms are adjacent to each other?		
<input type="checkbox"/> Yes	<input type="checkbox"/> No, maximum length of main circuits : _____ m	
If the main circuit(s) is/are not provided by the utility company, list the maximum power losses below:		
<u>Cable</u> Material : Copper/Aluminium* Design Current (I _b) : _____ A Cable Type : _____ Conductors Size : _____ mm ² Cable Length : _____ m Power Loss : _____ kW Percentage Power Loss : _____ %	<u>Busbar/Busduct</u> Material : Copper/Aluminium* Design Current (I _b) : _____ A Busduct Rating : _____ A Busduct Length : _____ m Power Loss : _____ kW Percentage Power Loss : _____ %	

Electrical Power Distribution Worksheet

Part 2

E. Feeder and Sub-main Circuits

Designed operating temperature of feeder and sub-main circuit conductors : _____°C

Schedule of Copper Losses for Dedicated Feeder & Sub-main Distribution Circuits
 (Note: circuits for Emergency Systems can be excluded):

Circuit Ref. (F = Feeder, S = Sub-main)	Cable Type	Conductor Size (mm ²)	Circuit Length (m)	Design Current I _b (A)	Design P.F.	Active Power (W)	Copper Loss (W)	Copper Loss (%)

Electrical Power Distribution Worksheet	Part 2
---	--------

F. Final Circuits

Are there any final circuits having a rating over 32A (single-phase or three-phase)?

- No
- Yes (Schedule of copper losses of these final circuits is listed as follows)

Schedule of Copper Losses for Final Circuits
 (Note: circuits for Emergency Systems can be excluded):

Circuit Ref.	Cable Type	Conductor Size (mm ²)	Circuit Length (m)	Design Current I _b (A)	Design P.F.	Active Power (W)	Copper Loss (W)	Copper Loss (%)

Electrical Power Utilisation Worksheet		Part 3
A. Lamps and Luminaires		
Do the lighting installations comply with the Code of Practice for Energy Efficiency for Lighting Installations?		
<input type="checkbox"/> Yes	<input type="checkbox"/> No, building / indoor space is for : <input type="checkbox"/> Domestic, <input type="checkbox"/> Medical, <input type="checkbox"/> Industrial, <input type="checkbox"/> Others _____	
B. Air Conditioning Installations		
Do the air conditioning installations comply with the Code of Practice for Energy Efficiency for Air Conditioning Installations?		
<input type="checkbox"/> Yes	<input type="checkbox"/> No, building is for : <input type="checkbox"/> Domestic <input type="checkbox"/> Medical <input type="checkbox"/> Industrial <input type="checkbox"/> Others _____	
C. Vertical Transportation		
Do the vertical transportation systems comply with the Code of Practice for Energy Efficiency for Lift & Escalator Installations?		
<input type="checkbox"/> Yes	<input type="checkbox"/> No	
D. Power Factor Improvement		
Anticipated total apparent power (S) for communal installations : _____ kVA Anticipated total active power (P) for communal installations : _____ kW Anticipated initial power factor before correction : _____ Design power factor after correction : _____ Type of power factor correction equipment used : _____ Rating of power factor correction equipment used : _____ kVAr Location of power factor correction equipment : _____ Other provisions for future use : <ol style="list-style-type: none"> 1. _____ 2. _____ 3. _____ 		

Electrical Power Utilisation Worksheet							Part 3
E. Motors and Drives							
Are there any motors or driving systems having an output rating of 5kW or greater?							
<input type="checkbox"/> No							
<input type="checkbox"/> Yes, schedule of motors is listed as follows:							
Motor Reference	Anticipated System Load (kW)	Motor Rating (kW)	Full Load Motor Efficiency (%)	Percentage Motor Rating to System Load (%)	VSD Type & Rating	Type of Power Transfer Devices	No. of Identical Motors

Electrical Power Quality Worksheet

Part 4

B. Balancing of Single-phase Loads

Are there any single-phase electrical loads (communal installations) connected in the three-phase four-wire power distribution system?

- No
- Yes, schedule of load currents in each phase is listed as follows:

Sub-main Circuit Ref. (with 1- phase loads)	Design Current in Red Phase I _R (A)	Design Current in Yellow Phase I _Y (A)	Design Current in Blue Phase I _B (A)	Average Current I _a (A)	Max. Deviation from Average I _d (A)	% Current Unbalance I _u = (I _d x100)÷ I _a (%)

Electrical Metering and Monitoring Worksheet	Part 5
A. Main Circuits	
Does the rating of any main incoming circuit exceed 400A, three-phase?	
<input type="checkbox"/> Yes Ammeter to read: <input type="checkbox"/> Red Phase Current (I_R) <input type="checkbox"/> Yellow Phase Current (I_Y) <input type="checkbox"/> Blue Phase Current (I_B) <input type="checkbox"/> Neutral Current (I_N) Voltmeter to read: <input type="checkbox"/> Red to Yellow Line Voltage (V_{RY}) <input type="checkbox"/> Yellow to Blue Line Voltage (V_{YB}) <input type="checkbox"/> Blue to Red Line Voltage (V_{BR}) <input type="checkbox"/> Red Phase to Neutral Voltage (V_{RN}) <input type="checkbox"/> Yellow Phase to Neutral Voltage (V_{YN}) <input type="checkbox"/> Blue Phase to Neutral Voltage (V_{BN}) <input type="checkbox"/> Power Factor Meter <input type="checkbox"/> kWh Energy Meter <input type="checkbox"/> Maximum Demand Meter (kVA) <input type="checkbox"/> Other metering provisions/facilities : _____ _____ _____ _____	<input type="checkbox"/> No
B. Sub-main and Feeder Circuits	
Does the rating of any sub-main/feeder circuit exceed 200A, three-phase?	
<input type="checkbox"/> Yes Ammeter to read : <input type="checkbox"/> Red Phase Current (I_R) <input type="checkbox"/> Yellow Phase Current (I_Y) <input type="checkbox"/> Blue Phase Current (I_B) <input type="checkbox"/> Neutral Current (I_N) <input type="checkbox"/> kWh Energy Meter <input type="checkbox"/> Other metering provisions/facilities : _____ _____ _____ _____	<input type="checkbox"/> No

Technical Data of Lift & Escalators Installation

For substantiation of compliance with Section 8 of COP in Energy Efficiency of BS Installations in Buildings (BEC)

Summary of Information on Lifts, Escalators & Conveyors	Part 1
Name of Building : _____	
Registered Energy Assessor :	
(Name): _____ (Registration No): _____	
(Submission Date): _____ (Signature): _____	
Type(s) of Installation : <input type="checkbox"/> Traction Lifts <input type="checkbox"/> Hydraulic Lifts <input type="checkbox"/> Escalators <input type="checkbox"/> Passenger Conveyors (tick where applicable)	
Submitted Forms, Drawings, Catalogues etc. (tick where applicable)	
Submittal	No. of Sheets
<input type="checkbox"/> Form EE-LE Part 1 (Summary of Information on Lifts, Escalators & Passenger Conveyors)	
<input type="checkbox"/> Form EE-LE Part 2 (Electrical Power, Total Harmonic Distortion and Total Power Factor of Traction Lift)	
<input type="checkbox"/> Form EE-LE Part 3 (Electrical Power, Total Harmonic Distortion and Total Power Factor of Hydraulic Lift)	
<input type="checkbox"/> Form EE-LE Part 4 (Electrical Power, Total Harmonic Distortion and Total Power Factor of Escalator)	
<input type="checkbox"/> Form EE-LE Part 5 (Electrical Power, Total Harmonic Distortion and Total Power Factor of Passenger Conveyor)	
<input type="checkbox"/> Form EE-LE Part 6 (Energy Management of Lifts, Escalators & Passenger Conveyors)	
<input type="checkbox"/> Drawings / Schedules to show the technical data of Lifts / Escalators (for substantiate the information in Part 2 of this Form).	
<input type="checkbox"/> Others (to give details) _____	

Electrical Power, Total Harmonic Distortion and Total Power Factor of Traction Lifts							Part 2
Lift Designation	Rated Load (kg)	Rated speed (m/s)	Circuit Current of Motor Drive (A)	Measured Running Active Power (kW)	Total Harmonic Distortion (%)	Total Power Factor	Decorative Load (kg)
All at rated load and at rated speed in the upward direction.							

Technical Data of Lift & Escalators Installation

Form EE-LF

For substantiation of compliance with Section 8 of COP in Energy Efficiency of BS Installations in Buildings (BEC)

Electrical Power, Total Harmonic Distortion and Total Power Factor of Hydraulic Lifts							Part 3
Lift Designation	Rated Load (kg)	Rated speed (m/s)	Circuit Current of Motor Drive (A)	Measured Running Active Power (kW)	Total Harmonic Distortion (%)	Total Power Factor	Decorative Load (kg)

All at rated load and at rated speed in the upward direction.

Electrical Power, Total Harmonic Distortion and Total Power Factor of Escalators								Part 4		
Escalator Designation	Rise of Escalator (m)	Step width (mm)	Rated Speed (m/s)	Motor Drive Circuit Current (A)		Measured Running Active Power (kW)		Total Harmonic Distortion (%) #	Supply from feeder circuit ? (yes or no)	Total Power Factor @
				#	@	#	@			
Non-public Service										
Public Service										

#: at no load and rated speed condition
 @: at brake load condition

Technical Data of Lift & Escalators Installation

For substantiation of compliance with Section 8 of COP in Energy Efficiency of BS Installations in Buildings (BEC)

Electrical Power, Total Harmonic Distortion and Total Power Factor of Passenger Conveyors								Part 5		
Conveyor Designation	Rise of Conveyor (m)	Step width (mm)	Rated Speed (m/s)	Motor Drive Circuit Current (A)		Measured Running Active Power (kW)		Total Harmonic Distortion (%) #	Supply from feeder circuit ? (yes or no)	Total Power Factor @
				#	@	#	@			
Non-public Service										
Public Service										
#: at no load and rated speed condition @: at brake load condition										

Technical Data of Lift & Escalators Installation

For substantiation of compliance with Section 8 of COP in Energy Efficiency of BS Installations in Buildings (BEC)

Energy Management of Lifts, Escalators & Passenger Conveyors			Part 6
LIFTS (tick/delete as appropriate)			
Zone Designation	Lift Bank with DC-MG motor drive	Energy Management	Provision of Metering Devices or provisions for connecting measuring devices for Lift Bank**
	Yes/No	<input type="checkbox"/> Standby mode <input type="checkbox"/> Switch off Ventilation when idling more than 2 minutes	<input type="checkbox"/> Voltmeter <input type="checkbox"/> Ammeter <input type="checkbox"/> kWh <input type="checkbox"/> Total Power Factor <input type="checkbox"/> Power <input type="checkbox"/> Maximum Demand <input type="checkbox"/> Connection points for the above meters
	Yes/No	<input type="checkbox"/> Standby mode <input type="checkbox"/> Switch off ventilation when idling more than 2 minutes	<input type="checkbox"/> Voltmeter <input type="checkbox"/> Ammeter <input type="checkbox"/> kWh <input type="checkbox"/> Total Power Factor <input type="checkbox"/> Power <input type="checkbox"/> Maximum Demand <input type="checkbox"/> Connection points for the above meters
	Yes/No	<input type="checkbox"/> Standby mode <input type="checkbox"/> Switch off ventilation when idling more than 2 minutes	<input type="checkbox"/> Voltmeter <input type="checkbox"/> Ammeter <input type="checkbox"/> kWh <input type="checkbox"/> Total Power Factor <input type="checkbox"/> Power <input type="checkbox"/> Maximum Demand <input type="checkbox"/> Connection points for the above meters
	Yes/No	<input type="checkbox"/> Standby mode <input type="checkbox"/> Switch off ventilation when idling more than 2 minutes	<input type="checkbox"/> Voltmeter <input type="checkbox"/> Ammeter <input type="checkbox"/> kWh <input type="checkbox"/> Total Power Factor <input type="checkbox"/> Power <input type="checkbox"/> Maximum Demand <input type="checkbox"/> Connection points for the above meters
ESCALATORS / CONVEYORS (tick/delete as appropriate)			
Group Designation	Number of Escalators/Passenger Conveyors in Group	Provision of Metering Devices or provisions for connecting measuring devices for Group of Escalators/Passenger Conveyors	
		<input type="checkbox"/> Voltmeter <input type="checkbox"/> Ammeter <input type="checkbox"/> kWh <input type="checkbox"/> Total Power Factor <input type="checkbox"/> Power <input type="checkbox"/> Maximum Demand <input type="checkbox"/> Connection points for the above meters	
		<input type="checkbox"/> Voltmeter <input type="checkbox"/> Ammeter <input type="checkbox"/> kWh <input type="checkbox"/> Total Power Factor <input type="checkbox"/> Power <input type="checkbox"/> Maximum Demand <input type="checkbox"/> Connection points for the above meters	
		<input type="checkbox"/> Voltmeter <input type="checkbox"/> Ammeter <input type="checkbox"/> kWh <input type="checkbox"/> Total Power Factor <input type="checkbox"/> Power <input type="checkbox"/> Maximum Demand <input type="checkbox"/> Connection points for the above meters	

Technical Data of Performance-based Approach

Form EE-PB

For substantiation of compliance with Section 9 of COP in Energy Efficiency of BS Installations in Buildings (BEC)

Compliance Summary	Part 1
---------------------------	---------------

A. Applicant Information

Name of organization:		
Address:		
Telephone no.:		
Fax no.:		
E-mail:		
Registered Energy Assessor (REA) responsible for the compliance:	Name: REA no.:	Telephone no.: Fax no.: E-mail:
Signature:		
Submission Date:		

B. Building Information

Name of Building :	
Address of Building :	
Primary building type:	
Other building usage(s):	
No. of storey:	
Building height (m):	
Gross floor area (m ²):	
Floor area (m ²):	
Air-conditioned floor area (m ²):	
Construction starting date:	
Expected completion date:	

The form shall be expanded to include all equipment under application. Additional sheets shall be used as appropriate.

Technical Data of Performance-based Approach

Form EE-PB

For substantiation of compliance with Section 9 of COP in Energy Efficiency of BS Installations in Buildings (BEC)

C. Summary of Building Energy Performance

	Designed Building	Reference Building
Design energy consumption (kWh)		-----
Total energy budget (kWh)	-----	
Breakdown of energy usage (kWh): - Area lights - Miscellaneous equipment - Space cooling - Space heating - Ventilation fans - Pumps - Other energy uses (pls. specify)		
Energy use intensity (kWh/m ² /year) (based on gross floor area)		

D. Renewable or Recovered Energy

Have you considered “renewable energy” or “recovered energy” and excluded it in the design energy consumption? Yes / No * (* delete where applicable)

If yes, please provide detailed information and calculation for the “renewable energy” or “recovered energy”. Use additional sheets if necessary.

DRAFT

The form shall be expanded to include all equipment under application. Additional sheets shall be used as appropriate.

Technical Data of Performance-based Approach

Form EE-PB

For substantiation of compliance with Section 9 of COP in Energy Efficiency of BS Installations in Buildings (BEC)

Basic Requirements Checklist	Part 2
-------------------------------------	---------------

1. Building Envelope

Building (Energy Efficiency) Regulation Cap.123 Sub. Leg. M	
Shading coefficient of window glasses shall be not less than 0.25.	

2. Lighting

<ul style="list-style-type: none"> • Minimum allowable luminous efficacy • Maximum allowable lamp control gear loss • Interior lighting control 	
--	--

3. HVAC

<p>Air Side System</p> <ul style="list-style-type: none"> • System load design • Separate distribution system • Air leakage limit on ductwork 	
<p>Water Side System</p> <ul style="list-style-type: none"> • Pumping system variable flow • Friction loss 	
<p>Control</p> <ul style="list-style-type: none"> • Temperature control • Humidity control • Zone control • Off hours control 	
<p>Insulation</p> <ul style="list-style-type: none"> • Piping insulation • Ductwork and AHU casing insulation 	

4. Electrical

<p>Power Distribution in Buildings</p> <ul style="list-style-type: none"> • High voltage distribution • Minimum transformer efficiency • Locations of distribution transformers and main LV switchboards • Main circuits • Feeder circuits • Sub-main circuits • Final circuits 	
<p>Efficient Utilization of Power</p> <ul style="list-style-type: none"> • Motors and drives • Power factor improvement 	
<p>Power Quality</p> <ul style="list-style-type: none"> • Maximum total harmonic distortion • Balancing of single-phase loads 	
<p>Metering and Monitoring Facilities</p> <ul style="list-style-type: none"> • Main circuits • Sub-main and feeder circuits 	

Technical Data of Performance-based Approach

For substantiation of compliance with Section 9 of COP in Energy Efficiency of BS Installations in Buildings (BEC)

Basic Requirements Checklist	Part 2
-------------------------------------	---------------

5. Lift & Escalator

Lifts <ul style="list-style-type: none"> • Maximum allowable electrical power • Energy management of lift cars • Total harmonic distortion of motor drive systems • Total power factor of motor drive systems 	
Escalators & Passenger Conveyors <ul style="list-style-type: none"> • Energy management of escalators & passenger conveyors • Maximum allowable electrical power of escalators & passenger conveyors • Total harmonic distortion of motor drive systems • Total power factor of motor drive systems 	

[Support Documentation]

<i>Description of document</i>	<i>No. of pages</i>

The form shall be expanded to include all equipment under application. Additional sheets shall be used as appropriate.

Technical Data of Performance-based Approach

Form EE-PB

For substantiation of compliance with Section 9 of COP in Energy Efficiency of BS Installations in Buildings (BEC)

Numerical Method for Building Energy Analysis	Part 3
--	---------------

1. General Information

Name of software/method:	
Software version number:	
Software release number (if any):	
Name of software license owner:	

2. Software Developer/Supplier

Organization that developed the software:	
Organization that supplied the software:	

3. Climatic Data

Climatic data used for the analysis:	
Format and nature of the climatic data:	

4. Systems or Equipment Not Yet Determined But Assumed

<i>Items</i>	<i>Description</i>

5. Other Modeling Assumptions

<i>Items</i>	<i>Description</i>

6. Limitations of the Software/Method

<i>Items</i>	<i>Description</i>

[Support Documentation]

<i>Description of document</i>	<i>No. of pages</i>
Input building description file (printed and electronic format)	
Output reports file (printed and electronic format)	

The form shall be expanded to include all equipment under application. Additional sheets shall be used as appropriate.

Technical Data of Performance-based Approach

For substantiation of compliance with Section 9 of COP in Energy Efficiency of BS Installations in Buildings (BEC)

Key Building Data Summary		Part 4
	Designed Building	Reference Building
1. General Information		
Total gross floor area (m ²)		
Average occupant density (m ² /person)		
Minimum outdoor air (l/s per person)		
2. Building Envelope		
Gross wall area (m ²)		
Window-to-wall ratio		
Shading coefficient of windows		
Gross roof area (m ²)		
Skylight-to-roof ratio		
Shading coefficient of skylights		
OTTV of exterior walls (W/m ²)		
OTTV of roof (W/m ²)		
External shading device provided?		
3. Lighting		
Average lighting power density (W/m ²)		
Day lighting design provided? How?		
4. HVAC		
Number of Chillers		
Total cooling capacity (kW)		
Total heating capacity (kW)		
Type of air side system		
Total design supply air flow rate (m ³ /s)		
Type of chiller plant		
Chiller coefficient of performance (kW/kW)		
5. Electrical		
Total installed equipment capacity (kW)		
Average equipment power density (W/m ²)		
6. Service Hot Water		
Service hot water provided? Fuel?		
Total heating capacity (kW)		

The form shall be expanded to include all equipment under application. Additional sheets shall be used as appropriate.

Technical Data of Performance-based Approach

For substantiation of compliance with Section 9 of COP in Energy Efficiency of BS Installations in Buildings (BEC)

List of Energy-related Features for Trade-off		Part 5
<i>Features</i>	<i>Description</i>	

[Support Documentation]

<i>Description of document</i>	<i>No. of pages</i>

The form shall be expanded to include all equipment under application. Additional sheets shall be used as appropriate.

DRAFT