



Common Irregularities of Statutory Submission

25 Feb. 2019

28 Feb. 2019

01 Mar. 2019

(REA Briefing 2019)

Energy Efficiency Office

Topics

- Proper Enquiry Procedure
 - Make use of Form EE-EN

- Cases of Common Irregularities
 - Walk through the Form EE-CH

Technical Circular No. 1 /2017

- Issued on 29 Dec. 2017
- **Form EE-EN**
 - MBEC Enquiry Form for **Project Specific Issue**
 - Address inquirer's concerns accurately
 - Make effective reply
 - Ensure proper record
- **Form EE-CH**
 - Checklist for COCR Stage 2 / FOC Submission

Form EE-EN

Section A (to be completed by REA and/or project team)	
Part 1: Issue and Background	
Building Name:	
Building Address:	
EMSD ref no.:	
Type of issue:	Type of Submission: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Scope of Installation: <input type="checkbox"/> LG <input type="checkbox"/> AC <input type="checkbox"/> EL <input type="checkbox"/> LE
Part 2: Enquiry	
<i>Please provide supporting information (eg. Schematic drawing, layout, calculation) in relation to the enquiry.</i>	
Part 3 : Assessment by REA and/or Project Team	
<i>REA please provide preliminary view and judgment with justificaiton on the above issue.</i>	
Signature of REA	
Reg No.	
Tel. No.	
Name	Fax No.
Date	E-mail

MBEC Enquiry Form for Project Specific Issue		Form EE-EN
To: Energy Efficiency Office, EMSD E-mail: mbec@emsd.gov.hk Fax: 2890 6081; or Post: Energy Efficiency Office, 7/F, EMSD HQs, 3 Kai Shing Street, Kln		
Section A (to be completed by REA and/or project team)		
Part 1: Issue and Background		
Building Name:		
Building Address:		
EMSD ref no.:		
Type of issue:	Type of Submission: <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
	Scope of Installation: <input type="checkbox"/> LG <input type="checkbox"/> AC <input type="checkbox"/> EL <input type="checkbox"/> LE	
Part 2: Enquiry		
<i>Please provide supporting information (eg. Schematic drawing, layout, calculation) in relation to the enquiry.</i>		
Part 3 : Assessment by REA and/or Project Team		
<i>REA please provide preliminary view and judgment with justification on the above issue.</i>		
Signature of REA		Reg No.
		Tel. No.
Name		Fax No.
Date		E-mail

Form EE-CH

- ❑ Frequently receiving incomplete & poor quality COCR & FOC submission contents
- ❑ Checklist for COCR Stage 2 / FOC Submission
- ❑ Effective on **1 Feb. 2018**
- ❑ To uplift submission quality, completeness of materials
- ❑ Listed items based on frequently issued, repetitive comments and common irregularities.

Form EE-CH

- General
- Lighting Installations
- Air-conditioning Installations
- Electrical Installations
- Lift and Escalator Installations

General

- REA Qualification
- Building Name
- Occupation Permit
- Developer Identity
- Application Fee
- Demarcation Plan
- Tenancy Agreement

Checklist for COCR Stage 2 / FOC Submission

Form EE-CH

Name of Building _____

EMSD Ref. No. (COCR Only) _____

Name of the REA _____

REA Registration No. _____

Date _____

REA Signature

General	REA Qualification	Latest record of professional qualification (e.g. HKIE, RPE, etc.) to requirement of REA registration.		
	Building Name	Name of building in both English and Chinese to be printed on the COCR. Such building name appeared in Form EE2, EE-SU and technical forms should be consistent.		Only Applicable for COCR
	Occupation Permit	Copy of Occupation Permit from Buildings Department.		Only Applicable for COCR
	Developer identity	Supporting information to show the legal identity of the Developer (e.g. copy of Company Registration) if the developer stated in Form EE2 is different from that as indicated on Occupation Permit.		Only Applicable for COCR
	Application Fee	A crossed cheque made to "The Government of the Hong Kong Special Administrative Region".		Only Applicable for COCR
	Demarcation Plan	All the submitted schematic diagrams, layouts plans have clearly demarcated the exact portion/area involved in the submission.		Only Applicable for COCR
	Tenancy Agreement	Copy of Deed of Mutual Covenant (DMC) or tenancy agreement showing future tenants/ occupiers will be reminded to comply with Section 12 of the BEEO.		- Only Applicable for COCR - for building with multi owners or occupier

General

- **REA Qualification**
 - Valid Membership
 - RPE, MHKIE;
 - MCIBSE/FSOE CEng. Etc.
- **Building Name**
 - Proposed office development..... ?
 - Proposed residential building..... ?
 - Not to report project name
 - English & Chinese
 - Print on COCR

General

- OP
 - Issue date (Form EE-SU's requirement)
 - Building usage
- Developer Identity
 - Legal identity (e.g. Company Registration), if different from OP
- Application Fee (Crossed Cheque)

General

- **Demarcation Plans**
 - Layout plan; schematic
 - Multiple towers on podium floors;
 - BEC governed Vs non-governed portion;
 - Carpark Vs Club House;
 - Retail Vs non-retail portion.
- **Tenancy Agreement**
 - Section 12, BEEO
 - Tenant maintains BSI standard to BEC Ed. in COCR

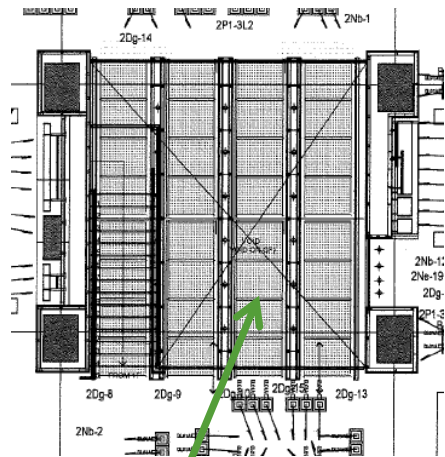
EE-LG(Lighting)

- Lighting Layout (General)
- Lighting Layout (Blow-up)
- Lighting Schedule (Luminaires Schedule)
- LPD Calculation
- Catalogue (Technical Detail /Justification)
- Scope of works
- Solely Decorative Lighting
- Automatic Lighting Control (ALC)

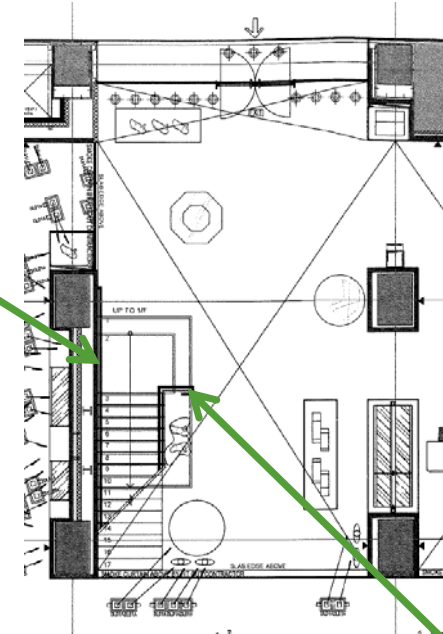
EE-LG(Lighting)

- **Lighting Layout (General)**
 - Scale (1:200 or larger)
 - Designation No. properly identified
 - Quantity countable on plan
 - Consistent with LPD Calculation, Catalogue, Lighting/ Luminaire Schedule;
 - Identify lighting spaces on plan; consistent with other schedules and Form EE-LG
 - Include vertically-mounted lighting
 - Quality of drawings

EE-LG Submission Quality

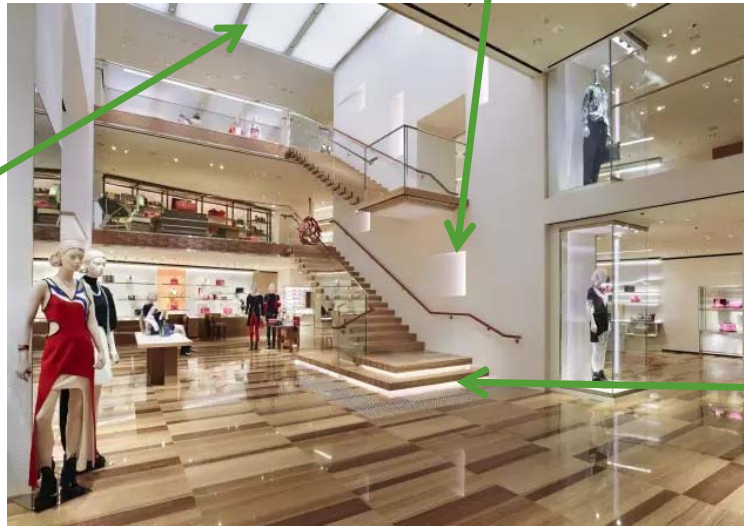


Light on vertical surface



Assign designation no. for involved lights

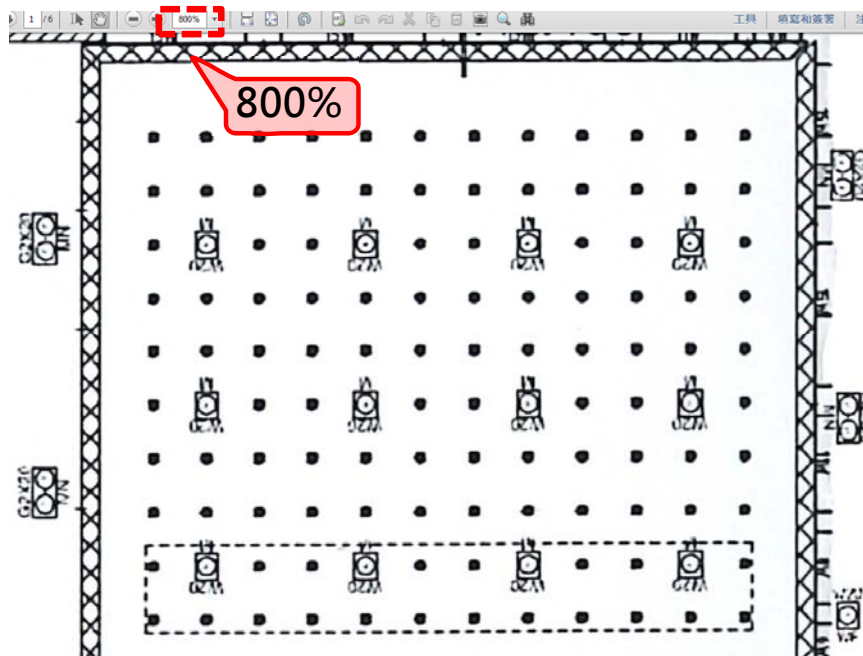
Completeness of Information



Strip light on steps



EE-LG Submission Quality



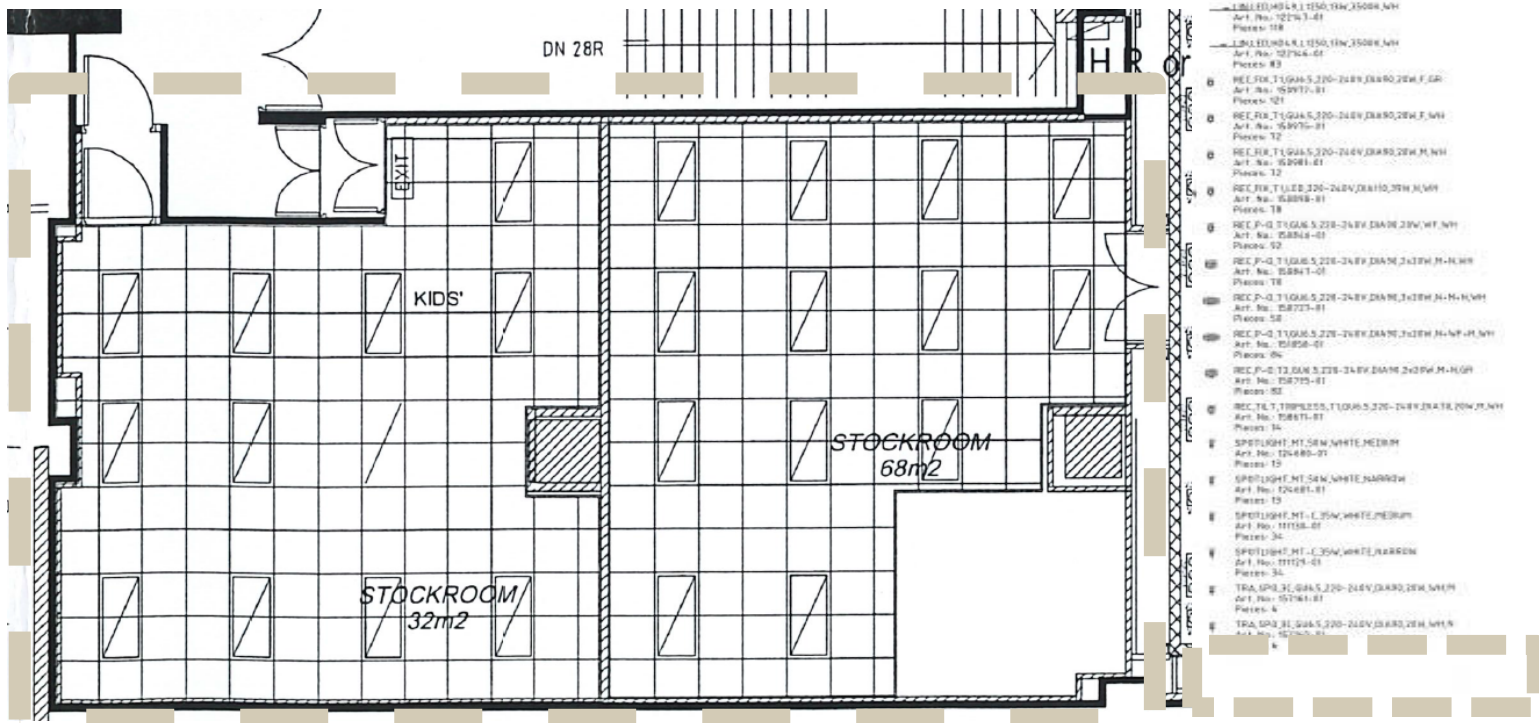
SCALE ?

800%

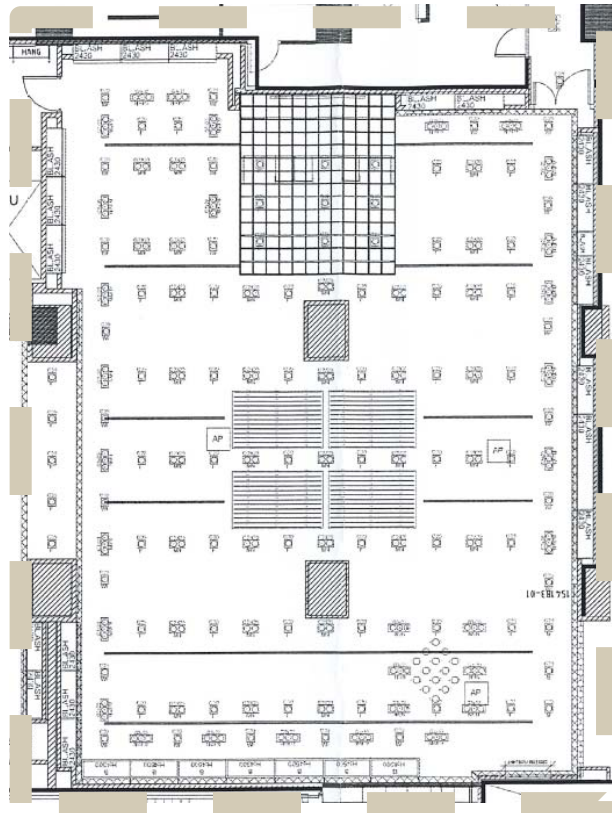
- LIN,LED,HD49,L1250,13W,3500K,WH
Art. No.: 122146-01
Pieces: 83
- REC,FIX,T1,GU6.5,220-240V,DIA90,20W,F,GR
Art. No.: 150977-01
Pieces: 121
- REC,FIX,T1,GU6.5,220-240V,DIA90,20W,F,WH
Art. No.: 150975-01
Pieces: 72
- REC,FIX,T1,GU6.5,220-240V,DIA90,20W,M,WH
Art. No.: 150981-01
Pieces: 72

EE-LG Submission Quality

Designation No. ?

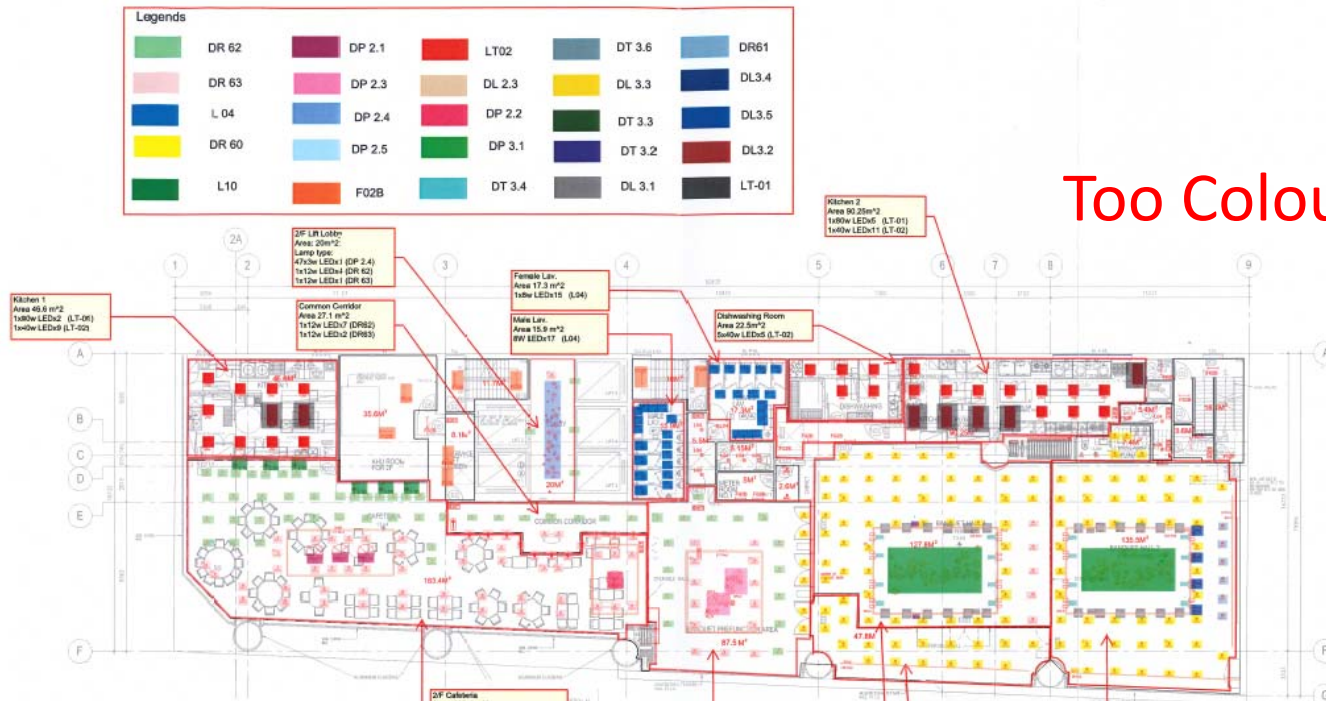


EE-LG Submission Quality



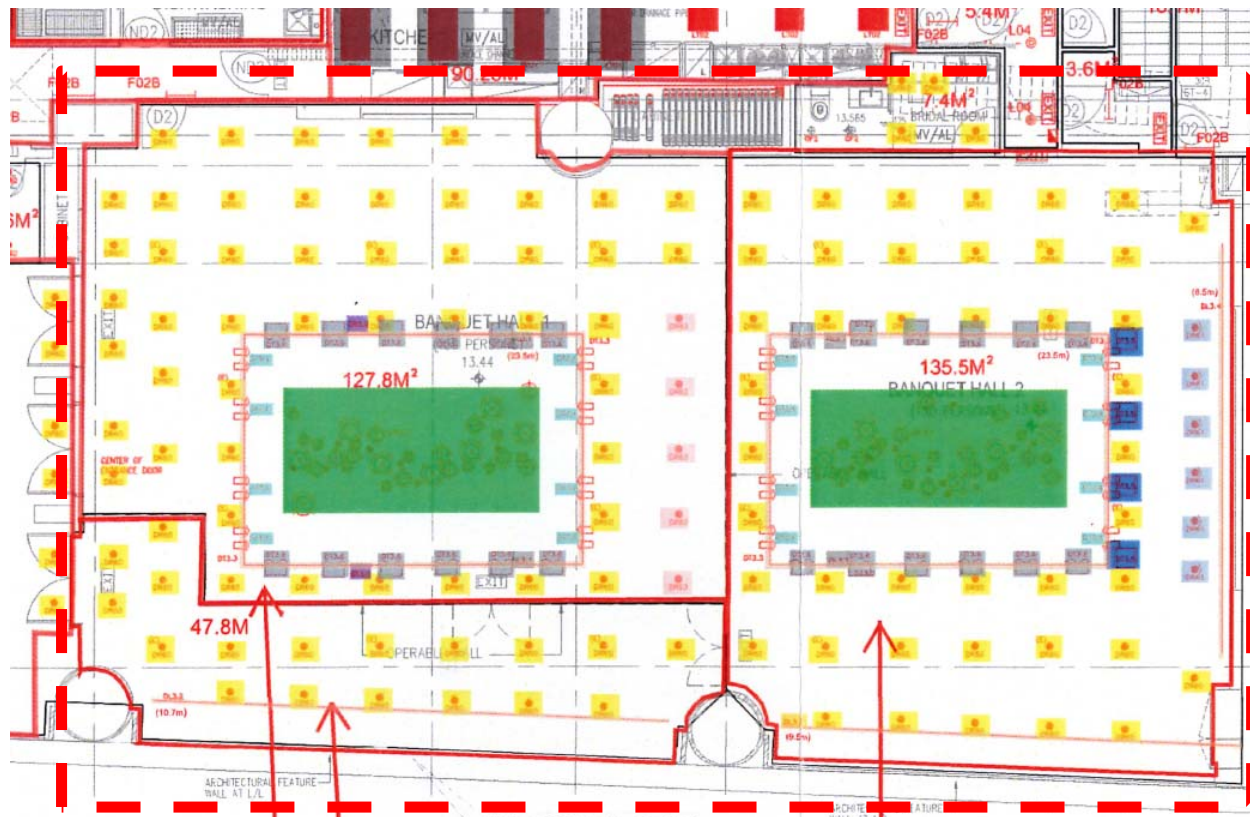
Space Naming ?
IFA for checking ?
Quantity Count ?

EE-LG Submission Quality



Too Colourful...

EE-LG Submission Quality



DL 3.3

DR 60

Colour Identification ...

EE-LG(Lighting)

- **Lighting Layout (Blow-up)**
 - Scale (1:100 or larger)
 - Key dimensions – IFA verification
 - Critical Spaces:
 - Reported LPD very close to limit (e.g. XX.99 W/m² ??)
 - Repetitive spaces: e.g. Typical Guest Room, Toilet on typical floors

EE-LG(Lighting)

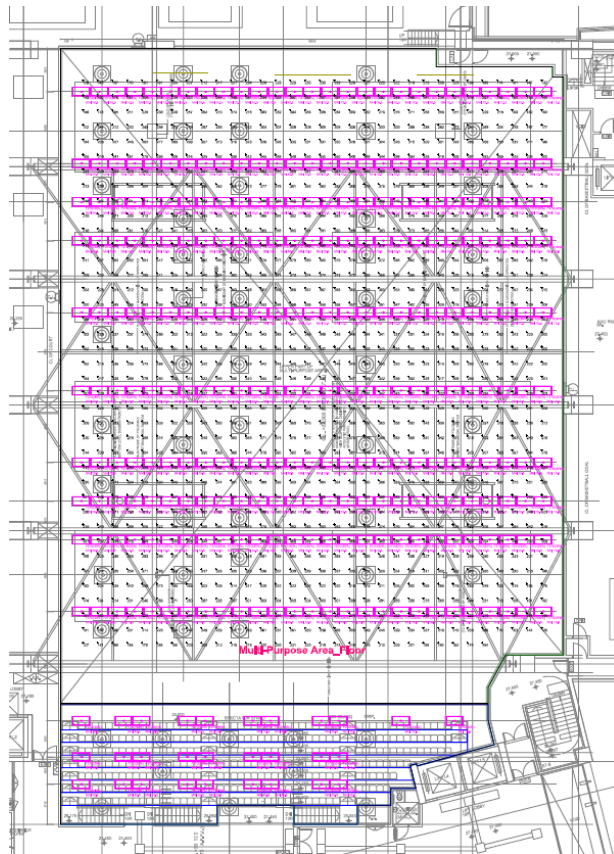
□ Lighting Schedule & Catalogue

- Comprehensive; with designation no.; lamp type; Wattage
- Consistency
- Gear loss from vendors' technical sheet

□ LPD Calculation

- Space Ref. No., designation no. , quantity
- Consistency
- Identify and justify space(s) with $\leq 70W$ (or $\leq 100W$ to BEC 2012)
- Staircase lighting at Scissor Staircase

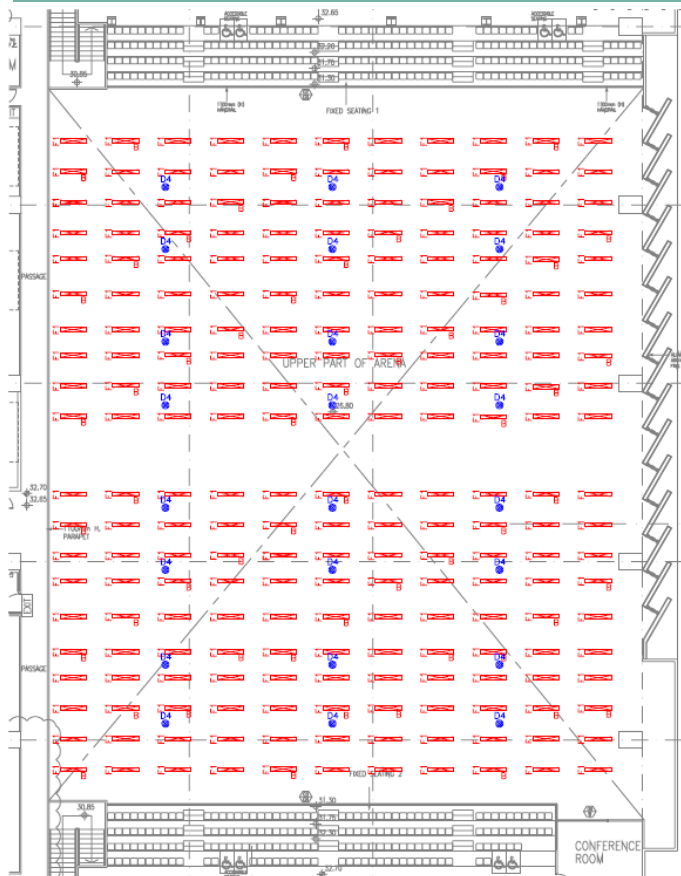
EE-LG(Special Lighting)



Design lux level	Purpose	No. of light fittings	Dimming level %	Internal floor area	LPD
1000	TV Broadcasting	299	Full output	1478 sq. m.	32.1
500	Competition	299	50%		16.4
300	Recreational	299	30%		9.9

1. No evidence showing that there is any lighting installation solely for TV broadcasting as prescribed under Schedule 2 of the BEEO;
2. Show no understanding on providing separated switching for the lighting installation to which the Ordinance is not applicable (BEC 5.5.4); and

EE-LG(Special Lighting)



	Normal Operation	Television Broadcasting
F1 (2x49W fluorescent tube)	All On	All On
D4 (400W high-bay light)	All Off	All On
Achieved Lux Level	750lx (by luminaire F1 only)	1200lx (by luminaires F1 + D4)
Lighting Power Density (LPD)	14W/m ²	20.05W/m ²
Max Allowable LPD in BEC 2015	17W/m ²	

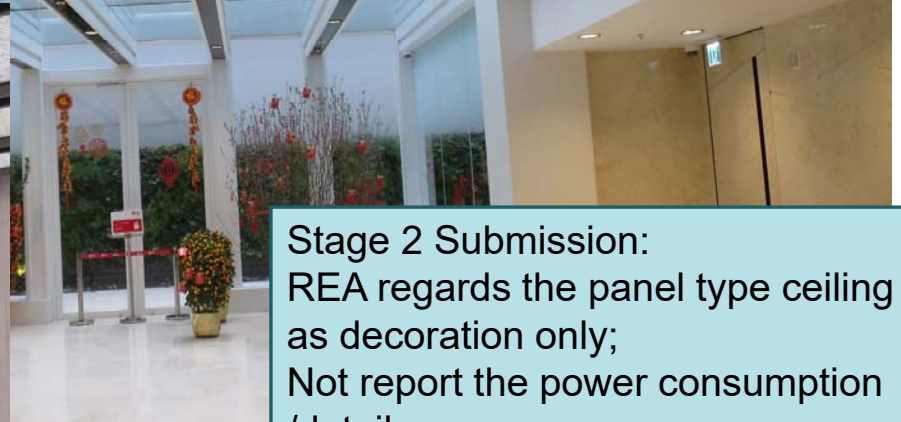
luminaire D4 could be regarded as the lighting installation **solely** used for television broadcasting

LPD requirements as prescribed under the BEC is therefore NOT applicable to such lighting installation

EE-LG(Decorative Lighting)

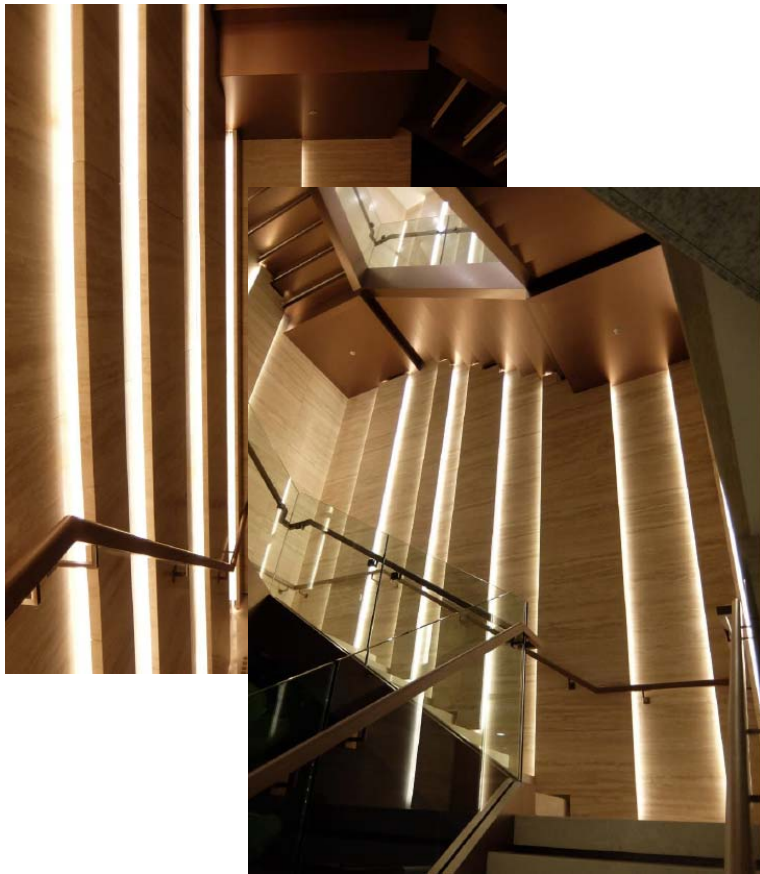
- **Solely Decorative Lighting**
 - Photo record with lighting effect (**NOT** the appearance of the fitting)
 - Highlighting on **plan**
 - Report LPD in **Form EE-LG Part 3**

EE-LG(Decorative Lighting)



Stage 2 Submission:
REA regards the panel type ceiling light
as decoration only;
Not report the power consumption
/details;
Not shown on plan
Missed out in Form EE-LG Part 2 and 3

EE-LG(Decorative Lighting)



Wall washer aiming at surface texture / vertical lighting might still be countable under the LPD calculation for not solely for decoration

EE-LG(Decorative Lighting)

Strip lights along steps might still be countable under the LPD calculation for not solely for decoration

Not regarded as solely for decoration



EE-LG(ALC)

- Automatic Lighting Control (ALC)
 - Assign lighting zone
 - Senor location
 - Photo record

EE-LG(ALC)

Technical Data of Lighting Installation for Building Energy Code (BEC) 2015
(Please refer to Section 5, Code of Practice for Energy Efficiency of Building Services Installation 2015 Edition)

Form EE-LG

Part 4 – Automatic Lighting Control (BEC Clause 5.6 and Table 5.4)					Page <input type="text"/> of <input type="text"/>		
Space(s) governed by the automatic lighting control requirement (BEC Table 5.4)			Automatic Lighting control (BEC Clauses 5.6.1) (please tick where applicable)		Daylight Responsive Control (BEC Clause 5.6.2 and 5.6.3) (please tick where applicable)		
Drawing No. of lighting layout	Name of space / Space Ref. No. *1	Area of space (m ²)	Type of control device deployed *2	Manual override provided	Daylight responsive control provided	Area (or Total Area) of: *3	
			<input type="checkbox"/> (a) <input type="checkbox"/> (b) <input type="checkbox"/> (c)	<input type="checkbox"/> Yes <input type="checkbox"/> N/A		Fenestration (m ²)	Assigned lighting zone(s) (m ²)
			<input type="checkbox"/> (a)		<input type="checkbox"/> Yes		

Remarks (applicable to Part 4) :-

- *1 Please indicate the space Ref No. / name of space on the relevant drawing. Exclude spaces each with total electrical power consumed by the complete fixed lighting installation of 150W or below.
- *2 Tick (a) for automatic time scheduling device. Please identify the type of control (e.g. By BMS, programmable timer, etc.) and the anticipated off-hour duration. Tick (b) for deploying occupant sensor. Tick (c) for other device as identified on the space provided.
- *3 Please insert total area for multiple discrete fenestrations or series of fenestration within the space. Please indicate the total of all the lighting zone areas within the space.

<input type="checkbox"/> (a)	<input type="checkbox"/> (b)	<input type="checkbox"/> (c)	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> N/A		
<input type="checkbox"/> (a)	<input type="checkbox"/> (b)	<input type="checkbox"/> (c)	<input type="checkbox"/> Yes <input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> N/A		

Remarks (applicable to Part 4) :-

- *1 Please indicate the space Ref No. / name of space on the relevant drawing. Exclude spaces each with total electrical power consumed by the complete fixed lighting installation of 150W or below.
- *2 Tick (a) for automatic time scheduling device. Please identify the type of control (e.g. By BMS, programmable timer, etc.) and the anticipated off-hour duration. Tick (b) for deploying occupant sensor. Tick (c) for other device as identified on the space provided.
- *3 Please insert total area for multiple discrete fenestrations or series of fenestration within the space. Please indicate the total of all the lighting zone areas within the space.

EE-LG(ALC)

Building Services Installation 2015 Edition)

(BEC Clause 5.6 and Table 5.4)

Control	Automatic Lighting control (BEC Clauses 5.6.1) (please tick where applicable)	Date
Area of (m ²)	Type of control device deployed *2	Manual override provided
	<input type="checkbox"/> (a) _____ <input type="checkbox"/> (b) _____ <input type="checkbox"/> (c) _____	<input type="checkbox"/> Yes <input type="checkbox"/> N/A
	<input type="checkbox"/> (a) _____ <input type="checkbox"/> (b) _____ <input type="checkbox"/> (c) _____	<input type="checkbox"/> Yes <input type="checkbox"/> N/A

Check (c) for other device and fill in device type

Check (a) for automatic time scheduling device
Fill in off-hour

Check (b) for occupant sensor

Fill in if provided w/ manual override and submit control diagram if yes



EE-LG(ALC)

Input total of lighting zone areas
Show each zones on plan

Input total fenestration area of that lighting space
Show on plan

Check Yes for applicable lighting space

Form EE-LG

Page of

Daylight Responsive Control (BEC Clause 5.6.2 and 5.6.3) (please tick where applicable)			
override vided	Daylight responsive control provided	Area (or Total Area) of: *3	
		Fenestration (m ²)	Assigned lighting zone(s) (m ²)
<input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> N/A		
<input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> N/A		
<input type="checkbox"/> N/A	<input type="checkbox"/> Yes <input type="checkbox"/> N/A		
<input type="checkbox"/> N/A	<input type="checkbox"/> Yes		

EE-AC(Air Conditioning)

- Coefficient of Performance
- System fan motor power
- AC Control
- Pressure drop & Flow Velocity
- Thermal Insulation
- Energy Metering

EE-AC(Air Conditioning)

□ Coefficient of Performance

- Chiller, U-AC, VRF System
- Justify with vendor's technical data
- Tender bid return, equipment schedule not acceptable

Part 6 – Air-conditioning Equipment Efficiency Worksheet Page 14 of 32
 (Please tick where applicable)

3) Any unitary air-conditioner / heat pump installation involved (BEC Clause 6.12)?
 Yes (if yes, please provide information in table below)
 No unitary air-conditioner / heat pump installation involved

Equipment Ref. No.	Technical catalogue Ref. No.	Air-cooled / Water-cooled *1	Capacity & COP *3 at cooling mode at full load			Capacity & COP *3 at heating mode at full load		
			Rated capacity (kW)	Rated COP *3	Min. allowed COP in BEC Table 6.12a (Part 1) / Clause 6.12.2	Rated capacity (kW)	Rated COP *3	Min. allowed COP in BEC Table 6.12a (Part 1) / Clause 6.12.2
(Please insert additional row if necessary)								
FCU-04	TCR-SW-400	Water-cooled	4.815	FCCOP=52.7	3.3	-	-	-
FCU-08	TCR-SW-800	Water-cooled	8.25	FCCOP=50.3	3.3	-	-	-
FCU-10	TCR-SW-1000	Water-cooled	9.285	FCCOP=48.5	3.3	-	-	-
FCU-12	TCR-SW-1200	Water-cooled	11.455	FCCOP=46.5	3.3	-	-	-

COP for FCU = 52.7!?

Mix-up the unit of kW
FOC < 60kW ?

HVAC system	Sets	RT	KW
FCU-8	32	32	31.808
		Total KW	<u>31.808</u>

HVAC system below 60KW

32TR = 112.6kW!

EE-AC(Air Conditioning)

- Energy Metering (EM)
 - Photo record - installed EM for chiller COP determination
 - Photo record - installed EM for chilled water plant COP determination
 - Water-cooled chilled water plant:
 - Energy metering of chilled water system
 - Metering devices - chillers
 - Metering devices – cooling towers
 - Metering devices – condenser water pump motors
 - Data feedback to DDC/CCMS/BMS

EE-EL(Electrical)

- Schematic wiring diagram related
- Cu loss calculation
- Metering Devices
- THD and TPF connection point
- Balancing of 1-phase load
- Motor Efficiency
- Motor sizing

EE-EL(Electrical)

- Schematic wiring diagram related
 - Involving multiple blocks/towers, shows demarcation for each blocks/towers
 - Highlight:
 - Circuits $>200A$ & $<400A$ (1-ph, 3-ph)
 - Circuits $\geq 400A$ (1-ph, 3-ph)
 - 3-ph meters from power co.
 - Metering devices
 - Spare ways for THD/TPF correction device connection

EE-EL(Electrical)

- Metering Devices
 - Technical Detail (Catalogue)
 - 31st order THD measurement
- THD and TPF connection points
 - Photo record of spare ways
 - Leasing/Tenancy agreement from Developer – tenant's scope on spare ways provision

EE-EL(Electrical)

□ Motor Efficiency

- Fan/pump motor catalogue as justification of the reported efficiency figures
- Consistency of model no./designation no./site installation
- Pump motors under other installations (e.g. plumbing & drainage, air conditioning) shall be included



Dismantling of the motor for flushing water up-feed pump-1



The new motor of potable and flushing water up-feed pump has been installed

Form EE-EL

(1) Based on the re-submitted "Part 3 at page 6 of 10" and the review on previous inspection record, it is found that the rated efficiency of the pump motors installed on site are deviated from the input value and cannot comply with Table 7.5.1.

Motor Efficiency mis-match on site

EE-EL(Electrical)

Motor Sizing

Calculation:

- Motor designation No.
- Fan air/Water pump flow rate;
- Pressure head;
- Fan/Pump efficiency;
- Anticipated system load;
- Rating of selected motor

$$\frac{\text{Motor Output Power}}{\text{Anticipated System Load}} \leq 125\%$$

Wrong Interpretation

Pump Schedule for Plumbing Installation

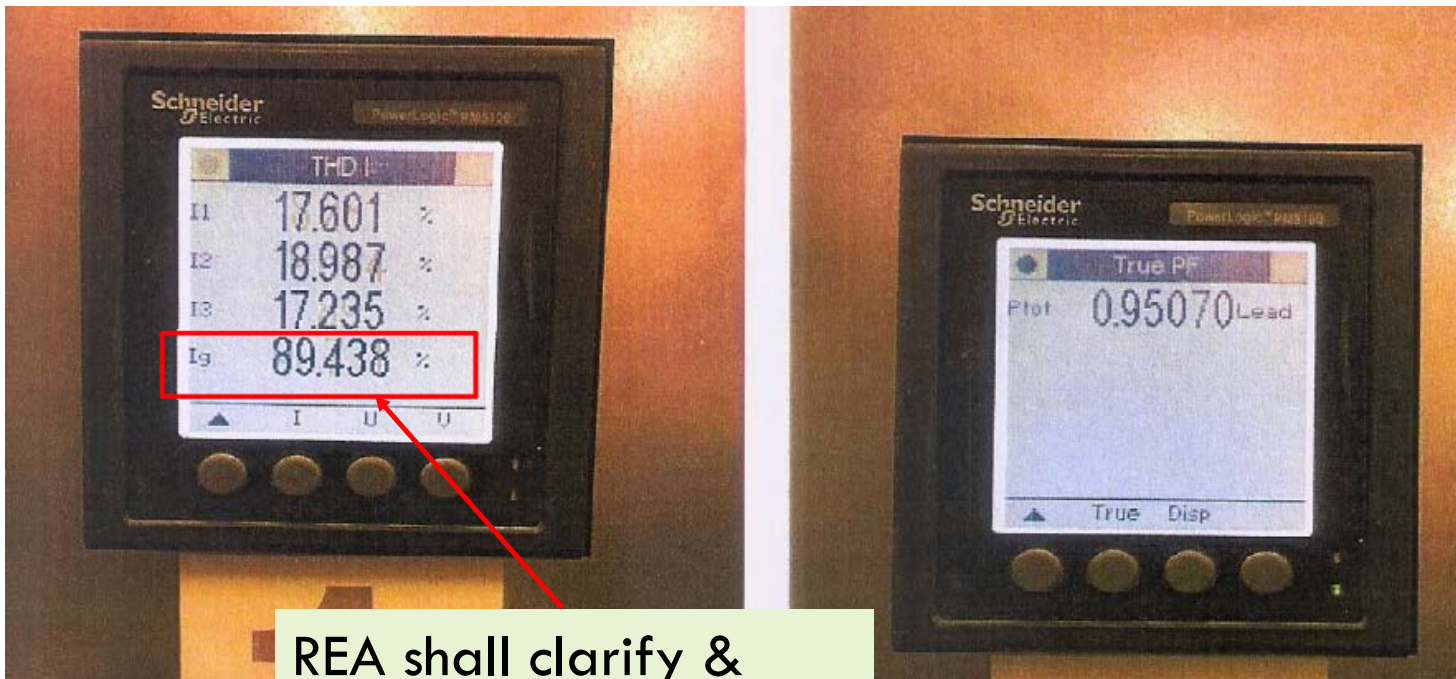
Item	Floor				Qty.	kW	Efficiency	BEC required	no. of pole	Flow rate (l/s)	Head (Bar)	System power	125% of System	Next Higher Rating of standard motor
P1	M/F	Fresh Water Upfeed Pump	FRWTP-01 &01	SPV-360-12/s	2	45	94.20%	94.20%	4	15	13	32.4	40.5	45
P2	LMR/F	Fresh Water Booster Pump	FRWBP-01 &01	SPV-350-3/s	2	5.5	87.7	87.70%	4	7	3	3.6	4.5	5.5
P3	M/F	Cleansing Water Booster Pump	CLWBP-01 &01	SPV-330B-6/s	2	1.5	82.8	82.80%	4	1	3	--	--	--
P4	M/F	Flush Water Upfeed Pump	FLWTP-01 &01	SPV-350-12/s	2	18.5	92.60%	92.60%	4	4.5	13	13.2	16.5	18

EE-LE(Lift & Escalator)

- Measurement Record (Running Power, TPF & THD etc.)
- Metering & monitoring devices
- Lift car decoration load
- Lift standby mode
- Escalator automatic speed reduction provision
- Lift regenerative braking
- Lift car lighting

EE-LE(Lift & Escalator)

▫ Metering & monitoring devices



REA shall clarify & rectify before sent us correct reading

Summary

- Advise/train your own frontline/junior staff to make proper enquiry
- An REA – Professional under the BEEO
- Submission quality
- View the drawing/information if readable, check for integrity & accuracy before making the submission
- Properly derive the compliance data
- DO NOT create your own EE standard/definition
- Refer TG-BEC
- Refer BEEO's website for more information

Thank You



《建築物能源效益條例》
氣候行動 全民節能

機電工程署
EMSD



機電工程署  EMSD