MECHANICAL & ELECTRICAL BUILDING SERVICES IN ARCHITECTURE DESIGN

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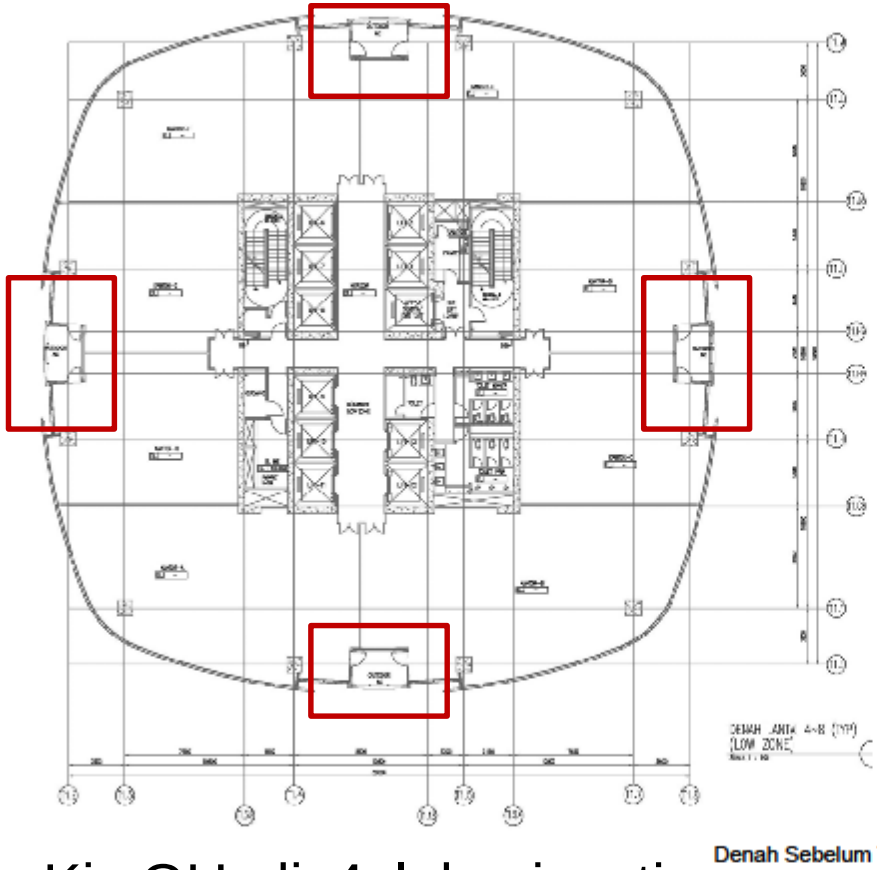
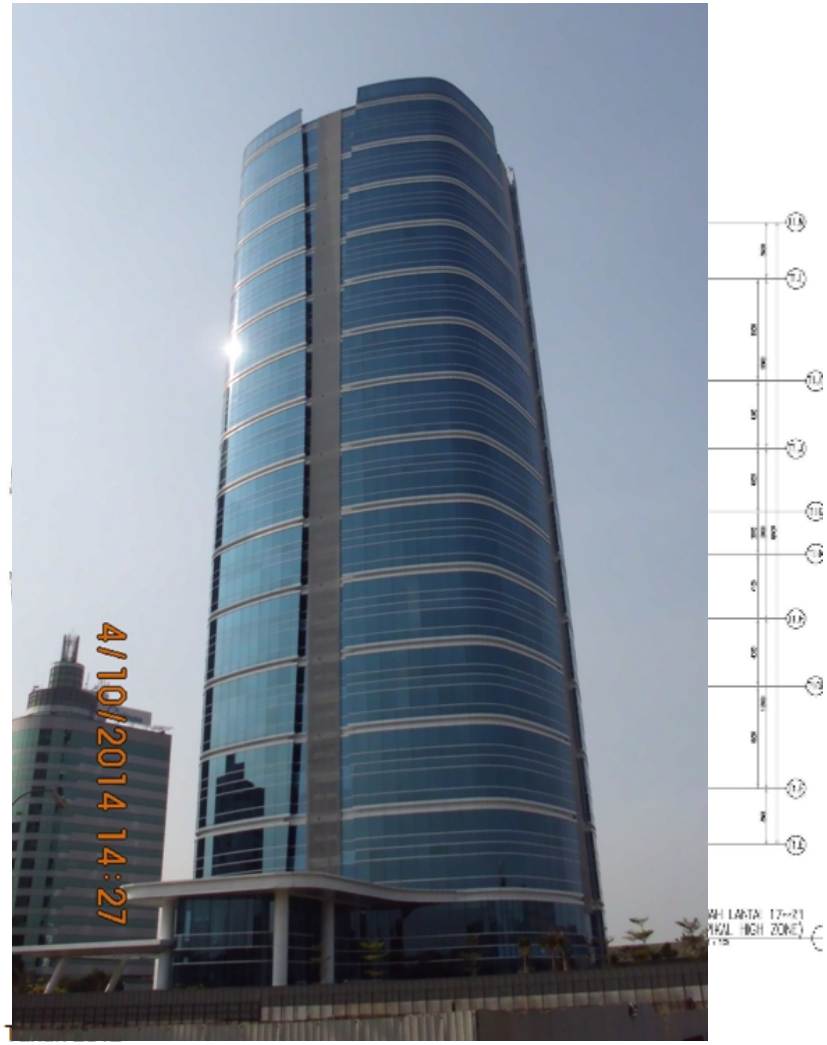
SISTEM AC VRV/VRF

Ki: Outdoor Unit di setiap lantai (bisa 2 atau 4 lokasi)

Ka: OU di lantai Atap

OUTDOOR UNIT AC VRV/F DI SETIAP LANTAI





Ki: OU di 4 lokasi setiap lantai

Ka: Tampak Luar Lokasi OU

SISTEM AC CHILLER

Ki: Air Cooled Chiller di Lt. Atap

Ka: Water Cooled Chiller di Lt. Basement

R. AHU PER LANTAI

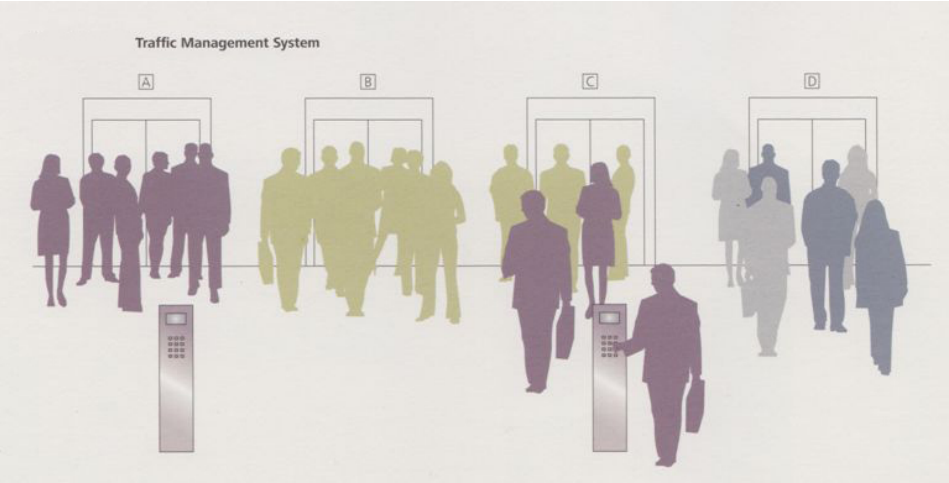
Denah Sebelum Tahun 2

Ki: R. AHU, 2 unit per lantai

Ka: Instalasi AHU per lantai

LIFT CONVENTIONAL vs TRAFFIC MANAGEMENT SYSTEM

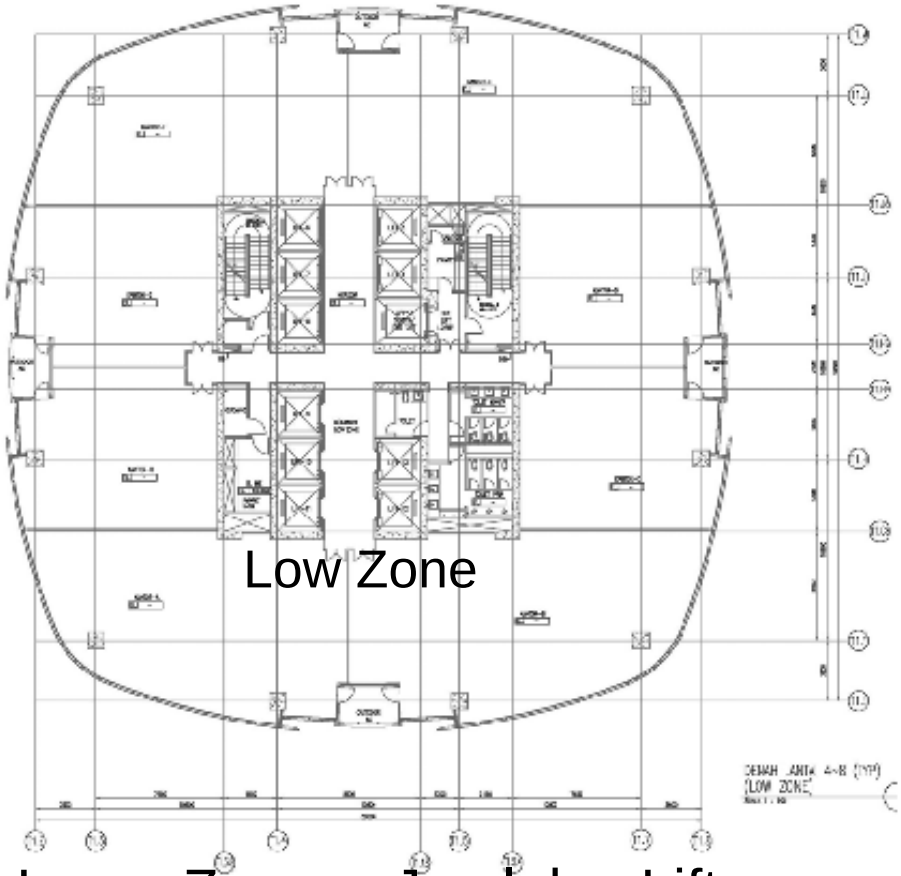
Atas: Conventional

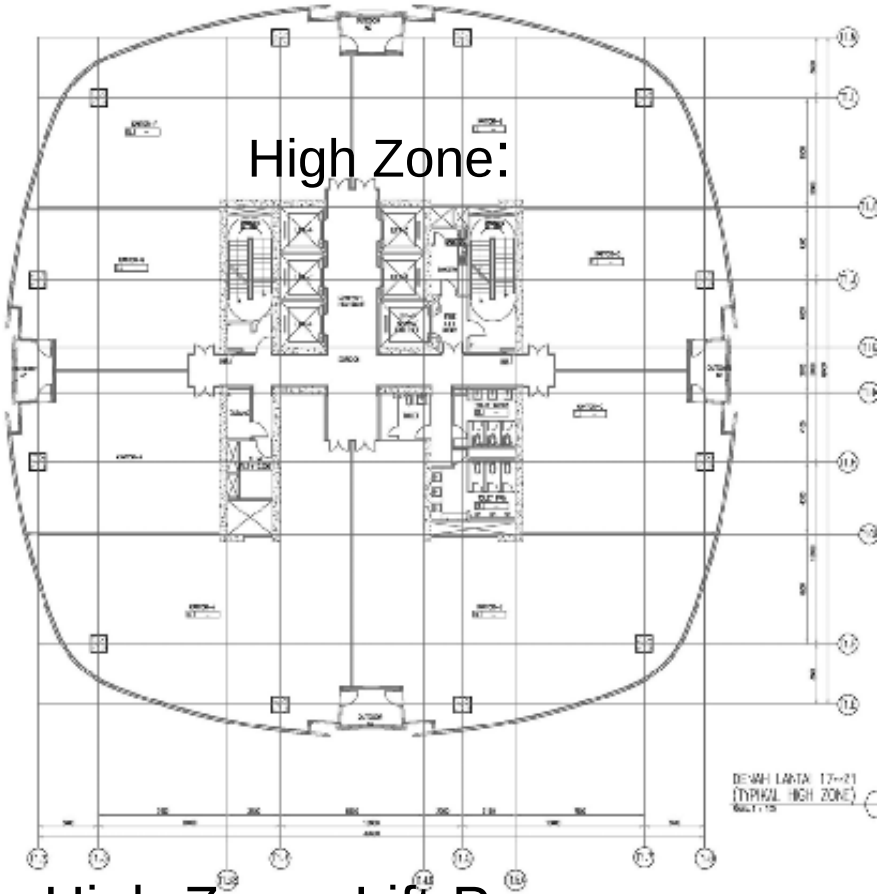


Atas: Perbandingan 2 sistem

Samping: Traffic Management System

LIFT DENGAN 2 ZONING





Denah Sebelum Tahun 2012

Low Zone: Jumlah Lift Penumpang LZ=5, HZ=5

High Zone: Lift Penumpang tinggal 5

Lift Fire/Kebakaran (1 unit) melayani semua lantai

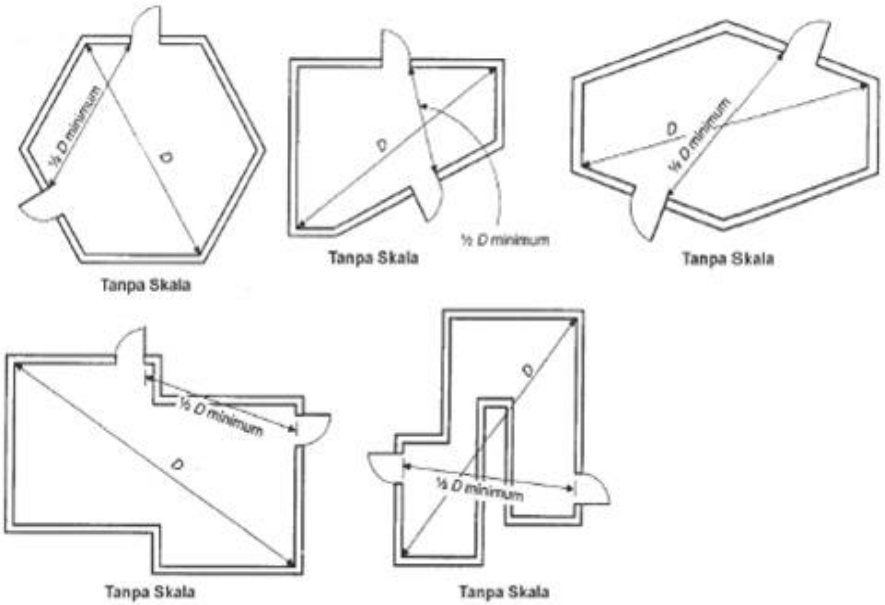
BUILDING CLASSIFICATION BASED ON LIFT TRAFFIC CRITERIA – OFFICE

Ave. waiting time (seconds)		
	SNI 03-6573-2001	Strakosch
• Diversified office ➢ Luxurious (Mewah) ➢ Commercial (Komersial)	- 25 – 35 25 – 35	25 – 30 - -
• Diversified single purpose	-	23 – 28
• Single purpose ➢ Government (Instansi)	- 30 – 40	20 – 25 -

BUILDING CLASSIFICATION BASED ON LIFT TRAFFIC CRITERIA – OFFICE

5-min HC (%)		
	SNI 03-6573-2001	Strakosch
• Diversified office ➢ Luxurious (Mewah) ➢ Commercial (Komersial)	- 10 – 12 11 – 13	10 – 11 - -
• Diversified single purpose	-	11 – 13
• Single purpose ➢ Government (Instansi)	- 14 – 17	12 – 18 -

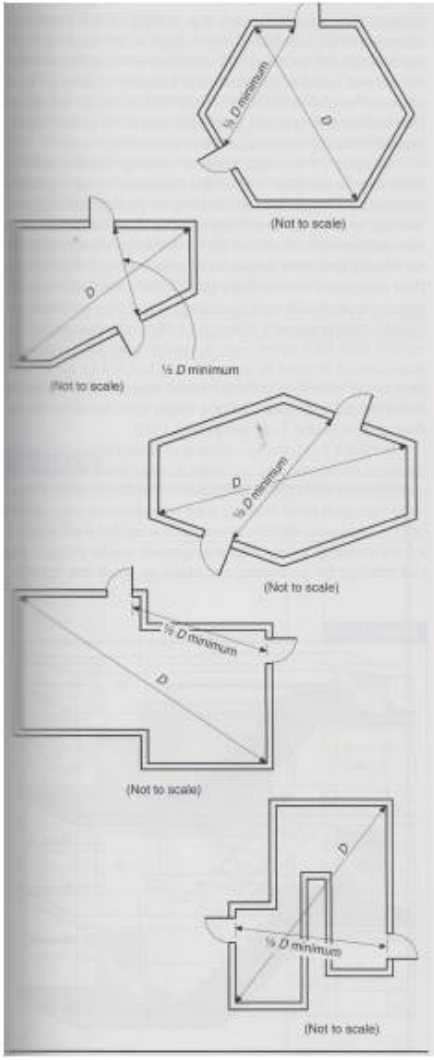
Peraturan Menteri Pekerjaan Umum No. 26/PRT/M/2008 tentang Persyaratan Teknis Sistem Proteksi Kebakaran Pada Bangunan Gedung Dan Lingkungan vs National Fire Protection Association (NFPA) 101 – Life Safety Code (2015)



Gambar A.3.13.1.3.2.(e) - Mengukur diagonal untuk daerah dengan bentuk khusus.

3.13.1.3.3 Dalam bangunan gedung terproteksi menyeluruh oleh sistem springkler otomatik yang tersupervisi dan disetujui sesuai butir 5.7, jarak pemisahan minimum antara dua eksit atau pintu akses eksit diukur sesuai butir 3.13.1.3.2, harus minimal sepertiga panjang diagonal maksimum bangunan gedung atau daerah yang dilayani.

3.13.1.3.4 Apabila ruang eksit terlindung disediakan sebagai eksit yang disyaratkan ditentukan pada butir 3.13.1.3.2 dan 3.13.1.3.3 dan dihubungkan oleh koridor yang mempunyai tingkat ketahanan api sekurang-kurangnya 1 jam, pemisahan eksit diperkenan kan untuk diukur sepanjang koridor.



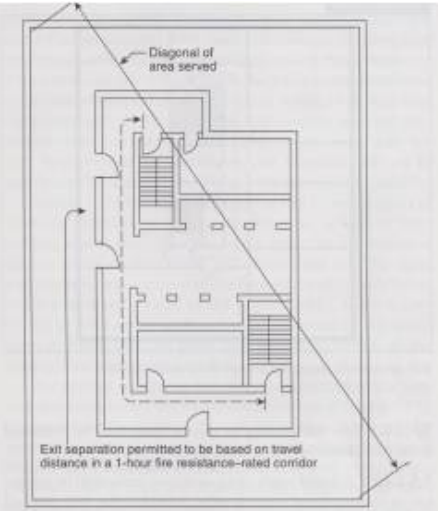


Figure A.7.5.1.3.4 Exit Separation Measured Along Corridor Path.

exit accesses, exits, and exit discharges are sufficiently remote to ensure, with reasonable certainty, that the same fire will not obstruct multiple egress routes. The exit separation is permitted by 7.5.1.3.3 to be reduced to one-third of the maximum overall diagonal measurement in fully sprinklered buildings, because the sprinkler system is expected to control the fire so that the use of multiple egress paths will not be lost.

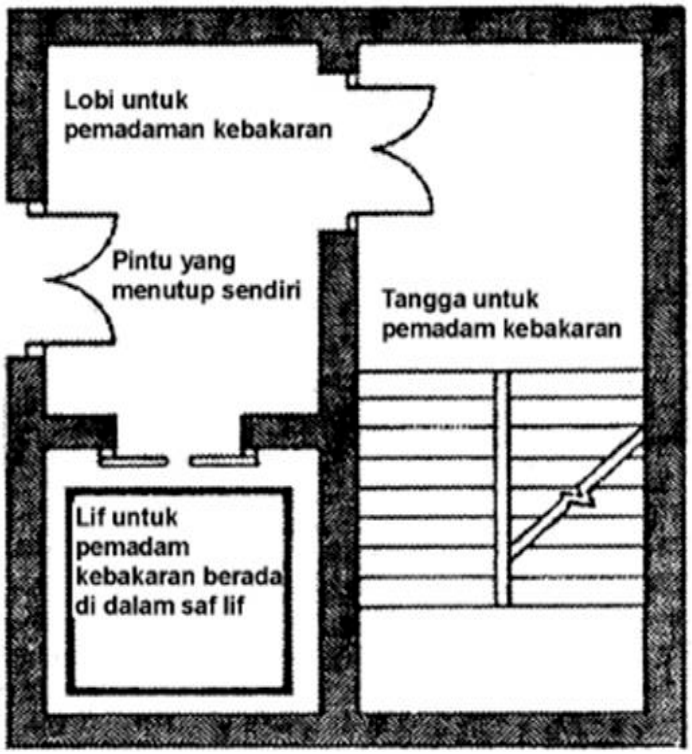
Although existing buildings are exempted by the provision of 7.5.1.3.5 from the diagonal rule of 7.5.1.3.2 and 7.5.1.3.3, they must meet the remoteness requirement via the performance requirement of 7.5.1.3.1. Therefore, in existing buildings, remoteness is not required to be judged via the diagonal rule; it must be met via the provision of 7.5.1.3.1.

Exhibit 7.170 illustrates the provision of 7.5.1.3.4, which permits — for other than high-rise buildings — the distance between exit enclosures to be measured along a minimum 1-hour fire resistance-rated corridor with appropriate fire protection-rated door assemblies. Although the exit enclosures are physically closer to each other than the dimension measured along the corridor, the exits will behave, under fire conditions, as if they were the corridor length apart.

Peraturan Menteri Pekerjaan Umum No. 26/PRT/M/2008 tentang Persyaratan Teknis Sistem Proteksi Kebakaran Pada Bangunan Gedung Dan Lingkungan

Tabel 2.4.3.2.(1) - Jumlah minimum saf untuk pemadaman kebakaran pada bangunan gedung yang dipasang springkler otomatis.

Luas lantai maksium (m^2)	Jumlah minimum saf pemadam kebakaran
Kurang dari 900	1
900 ~ 2.000	2
Lebih dari 2.000	2 ditambah 1 untuk tiap penambahan 1.500 m^2.



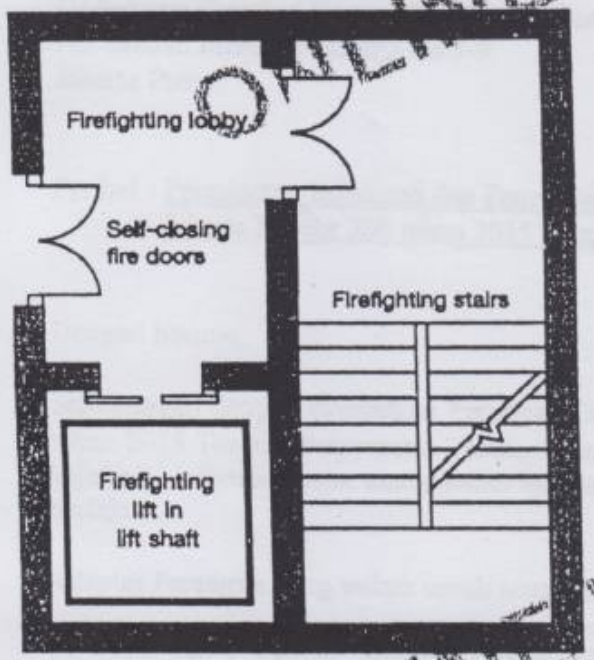
Gambar 2.4.3.3.(3) - Komponen-komponen Saf Pemadam Kebakaran.

British Standrad (BS) 5588-5:2000 & 2004 & 9999:2008, tentang Code of practice for fire safety in the design, management and use of buildings

with firefighting shafts in accordance with the recommendations of Section 3 of BS 5588-10:1991.

Diagram 52: Components of a firefighting shaft

See paras 18.1



Notes:

1 Outlets from a fire main should be located in the firefighting lobby.

Table 22: Minimum number of firefighting shafts in buildings fitted with sprinklers

Largest qualifying floor area (m²)	Minimum number of firefighting shafts
Less than 900	1
900–2000	2
Over 2000	2 plus 1 for every additional 1500m² or part thereof

18.8 Firefighting shafts provided in accordance with paragraph 18.7 should be located such that every part of every storey, other than fire service access level, is no more than 60m from the fire main outlet, measured on a route suitable for laying hose. If the internal layout is unknown at the design stage, then every part of every such storey should be no more than 40m in a direct line from the fire main outlet.

Design and construction of firefighting shafts

18.9 Except in blocks of flats and maisonettes (see paragraph 18.12), every firefighting stair and firefighting lift should be approached from the accommodation, through a firefighting lobby.

18.10 All firefighting shafts should be equipped with fire mains having outlet connections and valves in every firefighting lobby.

URUTAN M&E YANG HARUS DIPERHATIKAN OLEH ARSITEK

1. Sistem Pemadam Kebakaran (Active & Passive)
   - Jumlah dan jarak tangga kebakaran
   - Jumlah fire fighting lobby (tangga, lift & lobby)
   - Lintasan bersama, ujung buntu dan batas jarak tempuh
   - Lokasi R. Pompa Kebakaran dan tangki air kebakaran
   - Void
   - R. Fire Commad Center (FCC) – Pusat Kendali Kebakaran
   - Route Fire Engine (Truck) di sekeliling gedung

URUTAN M&E YANG HARUS DIPERHATIKAN OLEH ARSITEK

2. Lift
   - Jumlah lift penumpang (av. waiting time, 5% HC)
   - Jumlah lift kebakaran (lihat tabel Permen PU)
   - Zoning (Low, Medium, High) atau No Zoning
   - Shuttle lift
   - Jumlah lantai pelayanan
   - Tipe lift (dengan machine room atau roomless)
   - Jenis lift (umum, double decker)
   - Bukaan (single or double entrance)
   - Fungsi gedung
   - Jenis pemakaian (diversified office, single purpose, diversified single purpose)

URUTAN M&E YANG HARUS DIPERHATIKAN OLEH ARSITEK

3. Air Conditioning
   - Ruang chiller dan pompa (bila water cooled chiller)
   - R. AHU per lantai
   - Lokasi cooling tower
   - VRV/F – menjawab banyak keterbatasan ruang

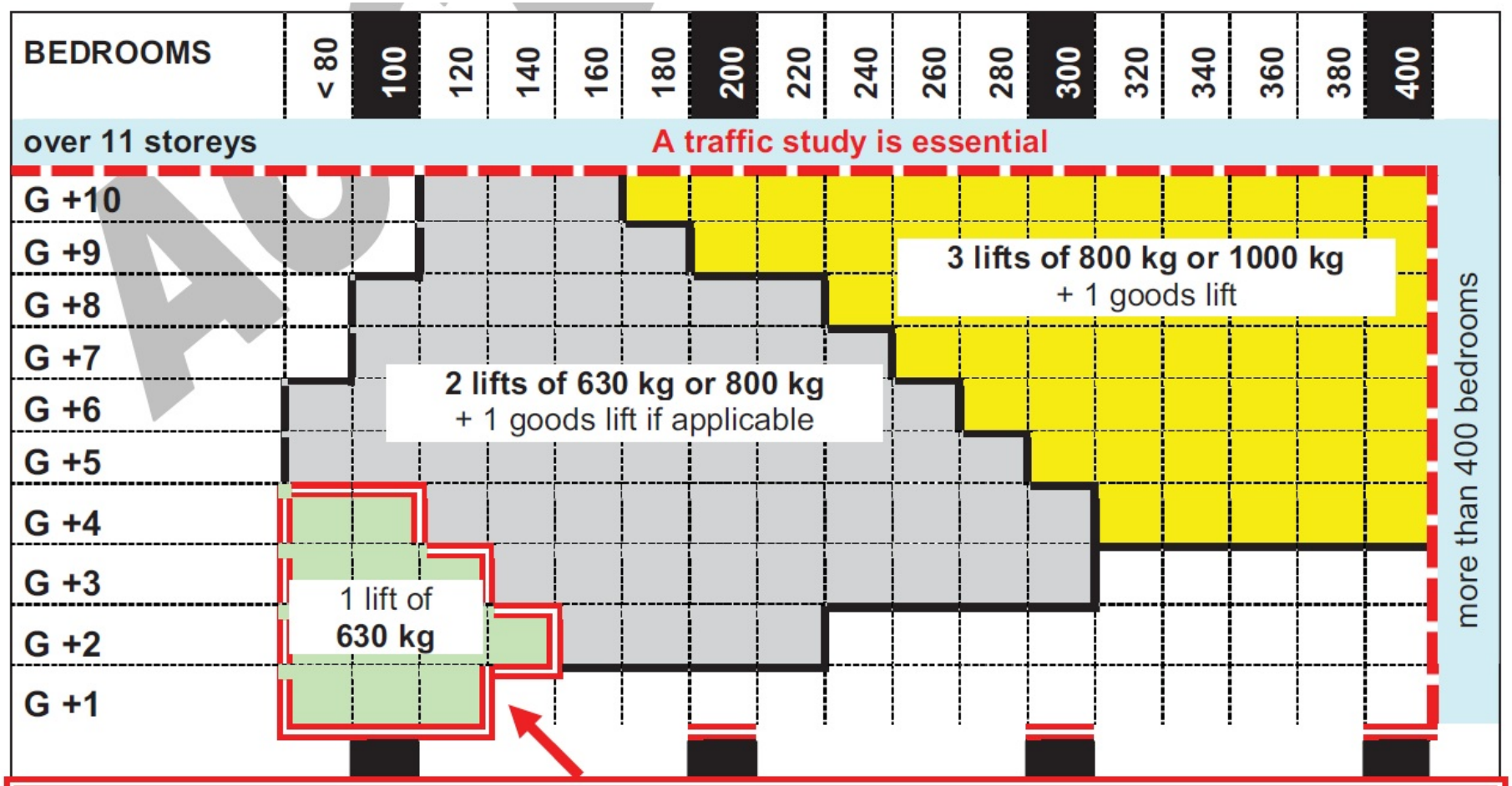
4. Electrical
   - R. Panel Medium Voltage
   - R. Trafo
   - R. Panel Low Voltage Main Switch Board (Utama)
   - R. Diesel Genset
   - R. Panel per lantai

URUTAN M&E YANG HARUS DIPERHATIKAN OLEH ARSITEK

5. Plumbing
   - Water tank
   - R. Pompa
   - Sewage Treatment Plant (STP)
   - Roof Water Tank
   - Toilet per lantai
   - Sumur Resapan Air Hujan
   - Kolam Resapan Air Hujan
   - Bak Penampung Air Hujan

6. Electronic
   - R. Fire Commad Center (10 ~ 12 m^2) di Ground Floor

For indicative purposes, for preliminary sizing, the following assumptions may be used (Sample from IBIS Hotel):



This specification shall only apply to this hotel brand. Larger hotels shall be subject to a particular study by the DESIGNERS.

THANK YOU

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