Common Issues and Problems encountered in FSD Processing of GBP Submissions

Fire Services Department
New Projects Division

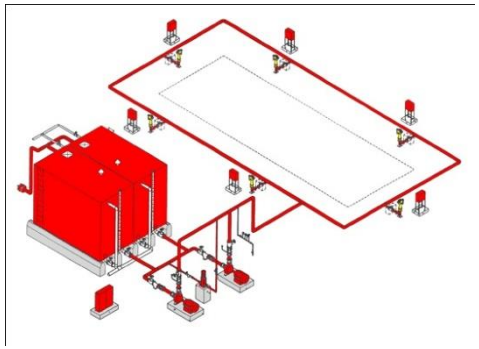
Contents

- Statutory role of FSD
- Procedure for building plan submissions
- Information required in GBPs
- Common issues encountered
- Fire Engineering Approach

Statutory Role of FSD

Buildings Ordinance

- Impose fire service installations requirements for buildings

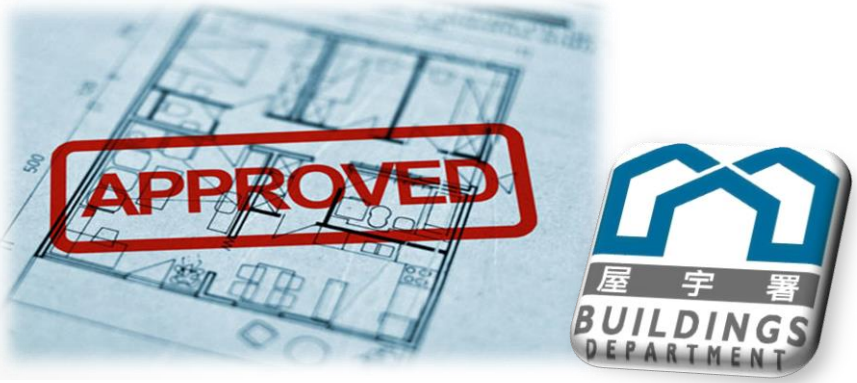


Statutory Role of FSD

Approval of Building Plans

Section 16(1)(b), Buildings Ordinance Chapter 123, Laws of HK

The Building Authority's approval to building plans



Serial No.: A 206923

Fire Services Department,
HONG KONG

Our Ref.:

Date: _____

Sir/Madam,

Address:— _____

Description of Building:— _____

This is to certify that the requirements of this Department have been incorporated in your plans.

One set of your plans stamped and signed by this Department on _____ _____ is returned together with an additional copy of this certificate for submission to the * ***Building Authority/Director of Housing***.

Note:—Any amendments to plans after approval by this Department should be resubmitted in duplicate through the ****Buildings/Housing*** Department for further vetting prior to the commencement of any construction works.

Yours faithfully,

for Director of Fire Services

Issued in accordance with Sub-paragraph (ii) of Paragraph (*b*) of Subsection (1) of Section 16 of the Buildings Ordinance.

* Delete where inappropriate

F.S. 161 (Rev. 9/09)

Statutory Role of FSD

Occupation Permit

Section 21(6)(d), Buildings Ordinance
Chapter 123, Laws of HK

The Building Authority's issuance of **Occupation Permit**

Procedure for Building Plan Submissions

Buildings Department

- **Centralized Processing System (CPS)**

PNAP ADM-2 Centralized Processing of Building Plans

- As a coordinator of GBP
- Circulate GBP to other departments for comments

Centralized Processing System

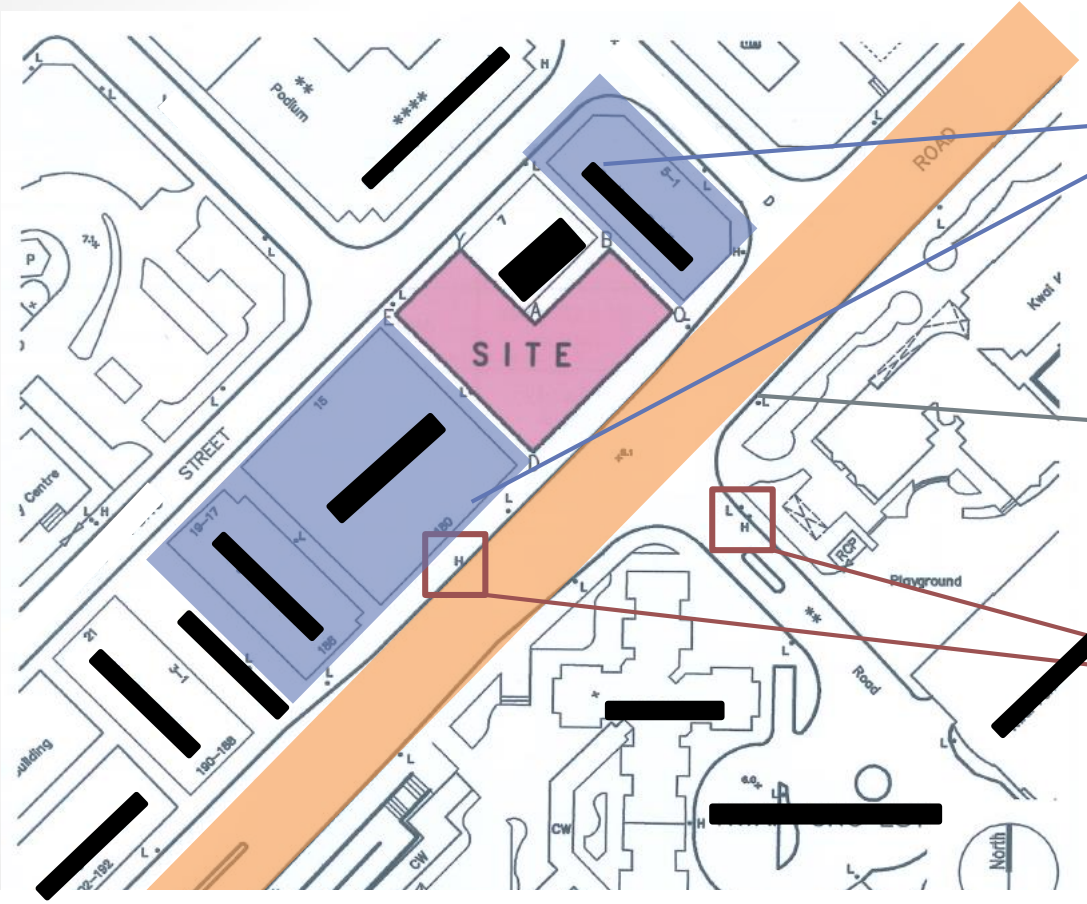
Centralized Processing System

Time frame

- GBP submissions
  - Set by BD, usually within 60 days for new submission, 30 days for amended plan (Section 30, Buildings Ordinance, Chapter 123A, Laws of HK)
- Enquiry submissions
  - First come first serve basis
- Fire engineering Performance Base submissions and approval
  - First come first serve basis

Information required in GBPs

(i) Site Location



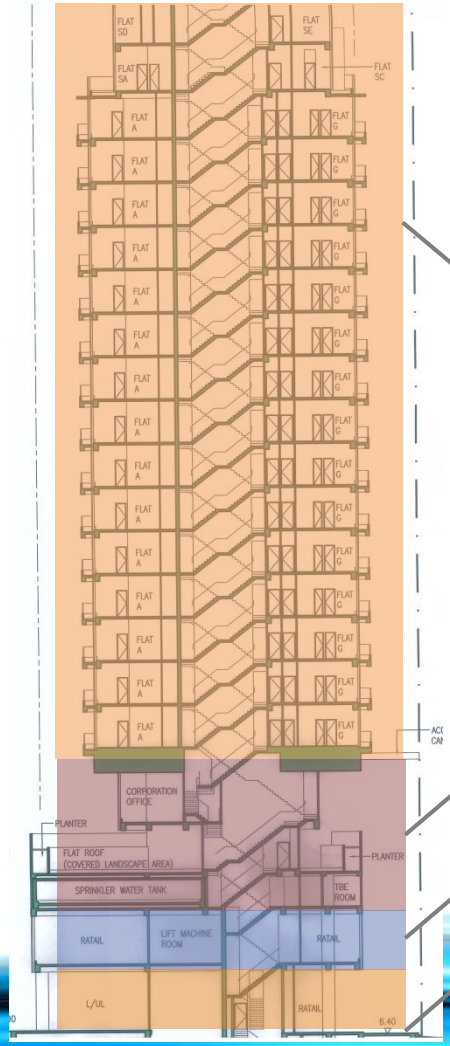
Nearby Buildings / Special Hazards

Access Road

Street Fire Hydrants

Information required in GBPs

(ii) Occupancies and Layout of the Buildings



4.23 Domestic Building – High Rise

4.31 Institutional Building – Low Rise

4.14 Commercial Building – Low Rise

4.26 Garage

Information required in GBPs

(iii) FS Notes

- Demonstrate FSI proposal

FIRE SERVICES NOTES :

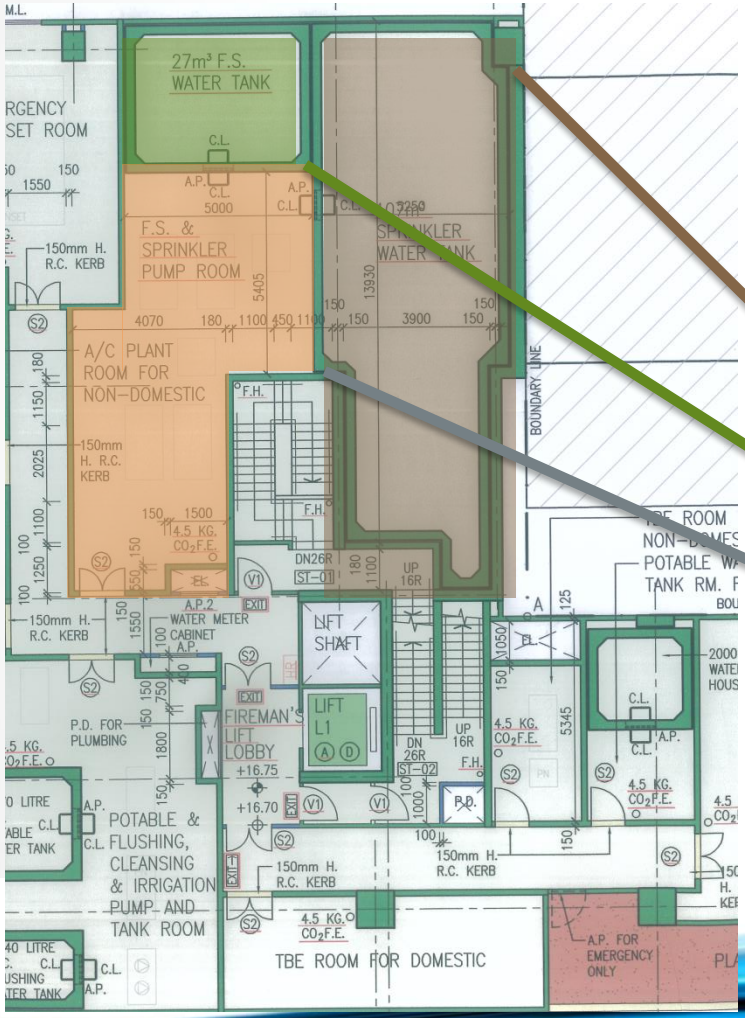
1. SPRINKLER SYSTEM:
A) ONE AUTOMATIC SPRINKLER SYSTEM WILL BE PROVIDED FOR THE ENTIRE SCHOOL CAMPUS DESIGNED IN ACCORDANCE WITH LPC RULES TO BSEN 12845:2003 AND HKFSD CIRCULAR LETTER NO. 3/2006 & 3/2012.
B) THE DESIGN HAZARD OF THE SPRINKLER SYSTEM OF ENTIRE SCHOOL CAMPUS SHALL BE OH 1.
C) THE SPRINKLER SYSTEM WILL BE PROVIDED FOR ENTIRE SCHOOL CAMPUS. EXCEPT ALL E&M PLANT ROOMS, WATER METER CABINETS AND PIPE DUCTS.
D) SPRINKLER INLETS WILL BE PROVIDED AT G/F AS INDICATED ON PLANS. ALL SPRINKLER INLETS WILL BE INTERCONNECTED.
E) A 47,000L SPRINKLER R.C. WATER TANK WILL BE PROVIDED AT G/F AS INDICATED ON PLAN.
F) SPRINKLER ANNUNCIATION PANEL (F.S. CONTROL PANEL) AND SPRINKLER CONTROL VALVES WILL BE PROVIDED AT G/F F.S. & SPRINKLER INLET, SPRINKLER CONTROL VALVES & F.S. CONTROL PANEL CABINET AS INDICATED ON PLANS.
G) ONE SET OF SPRINKLER PUMP (ONE DUTY, ONE STANDBY AND ONE JOCKEY PUMPS) WILL BE PROVIDED AT G/F FS AND SPRINKLER PUMP ROOM AS INDICATED ON PLANS.
H) THE SPRINKLER ALARM WILL BE CONNECTED TO THE FIRE SERVICES COMMUNICATION CENTRE VIA F.S. DIRECT TELEPHONE LINK.

2. FIRE HYDRANT AND HOSE REEL SYSTEM:
A) ONE FIRE HYDRANT / HOSE REEL SYSTEMS WILL BE PROVIDED FOR THE ENTIRE SCHOOL CAMPUS DESIGNED IN ACCORDANCE WITH CODES OF PRACTICE AND HKFSD CIRCULAR LETTER NO. 2/2013 REQUIREMENTS.
B) A 36,000L FS R.C. WATER TANK AND PUMP ROOM WILL BE PROVIDED AT G/F AS INDICATED ON PLAN.
C) F.S. INLETS WILL BE PROVIDED AT G/F AS INDICATED ON PLANS. ALL F.S. INLETS WILL BE INTERCONNECTED
D) ONE SET OF FIXED FIRE PUMP (ONE DUTY, ONE STANDBY AND ONE JOCKEY PUMP) WILL BE PROVIDED AT G/F FS PUMP ROOM AS INDICATED ON PLANS.
E) SUFFICIENT FIRE HYDRANT AND HOSE REEL WILL BE PROVIDED FOR THE ENTIRE SCHOOL CAMPUS. FIRE HYDRANTS WILL BE PROVIDED IN ALL REQUIRED STAIRCASES ENCLOSURES. HOSE REELS WILL BE PROVIDED TO ENSURE THAT EVERY PART OF THE FLOOR CAN BE REACHED BY A LENGTH OF NOT MORE THAN 30M HOSE REEL TUBING.
~~F) NO HOSE REELS WILL BE PROVIDED TO UNCOVERED ATHLETIC COURT.~~

3. AUTOMATIC FIRE DETECTION AND MANUAL FIRE ALARM SYSTEM:
A) AUTOMATIC FIRE DETECTION AND MANUAL FIRE ALARM SYSTEM WILL BE PROVIDED IN ACCORDANCE WITH LPC RULES OF BS 5839-1:2002 + A2:2008 AND HKFSD CIRCULAR LETTER NO. 1/2008, 3/2010 AND 2/2012.
B) A MANUALLY OPERATED FIRE ALARM SYSTEM C/W MANUAL BREAK GLASS AND ALARM BELL WILL BE PROVIDED THROUGHOUT THE BUILDING AND INCORPORATED IN FH/HR INSTALLATION.
C) AUTOMATIC FIRE DETECTION SYSTEM WITH ~~HEAT~~ DETECTORS WILL BE PROVIDED TO ALL E&M PLANT ROOMS EXCEPT E&M DUCTS SUCH AS CABLE DUCTS, CABLE TRENCHES, TELEPHONE DUCTS, WATER METER CABINETS, TOP OF LIFT SHAFTS AND PIPE DUCTS.
D) VISUAL FIRE ALARM WILL BE PROVIDED IN ACCORDANCE WITH BARRIER FREE ACCESS 2008 AND HKFSD CIRCULAR LETTER NO. 2/2012.
E) ALL ALARM SIGNALS WILL BE TRANSMITTED TO THE F.S. CONTROL PANEL LOCATED AT G/F F.S. & SPRINKLER INLET, SPRINKLER CONTROL VALVES & F.S. CONTROL PANEL CABINET AS INDICATED ON PLANS AND WILL ~~BE~~ REPEATED TO REPEATER PANEL IN GENERAL OFFICE.
F) COMMON FIRE ALARM SIGNALS ~~AND~~ WILL BE REPEATED TO REPEATER PANEL IN GENERAL OFFICE AND WILL BE TRANSMITTED TO THE FIRE SERVICES COMMUNICATION CENTRE VIA A DIRECT TELEPHONE.

Information required in GBPs

(iv) Key Elements of Major FSI

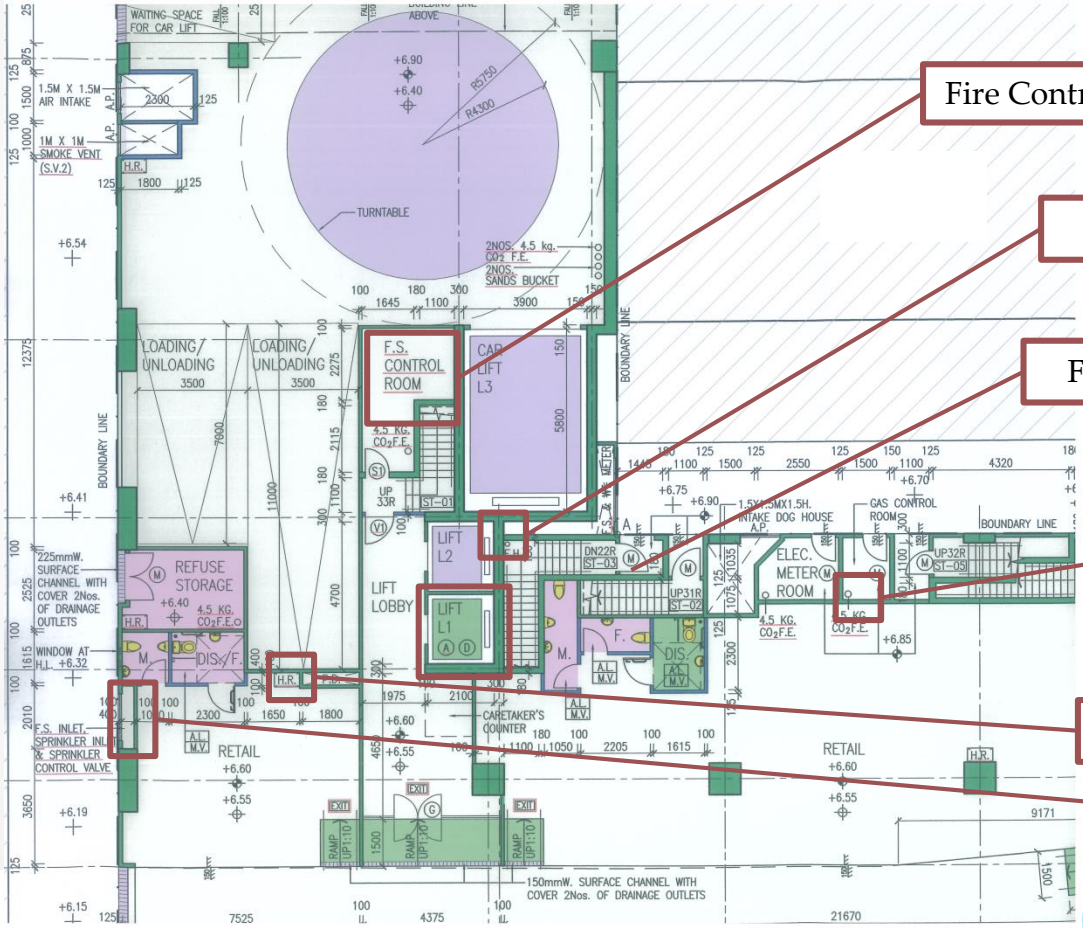


- Fire hydrant / hose reel
- Sprinkler
- Drencher

  - Water supply
  - Tank sizes
  - Duty pumps
  - Intermediate booster pumps
  - Inlets
  - Control valves

Information required in GBPs

(v) Locations of FSI



Fire Control Centre

Fire Hydrant

Fireman's Lift

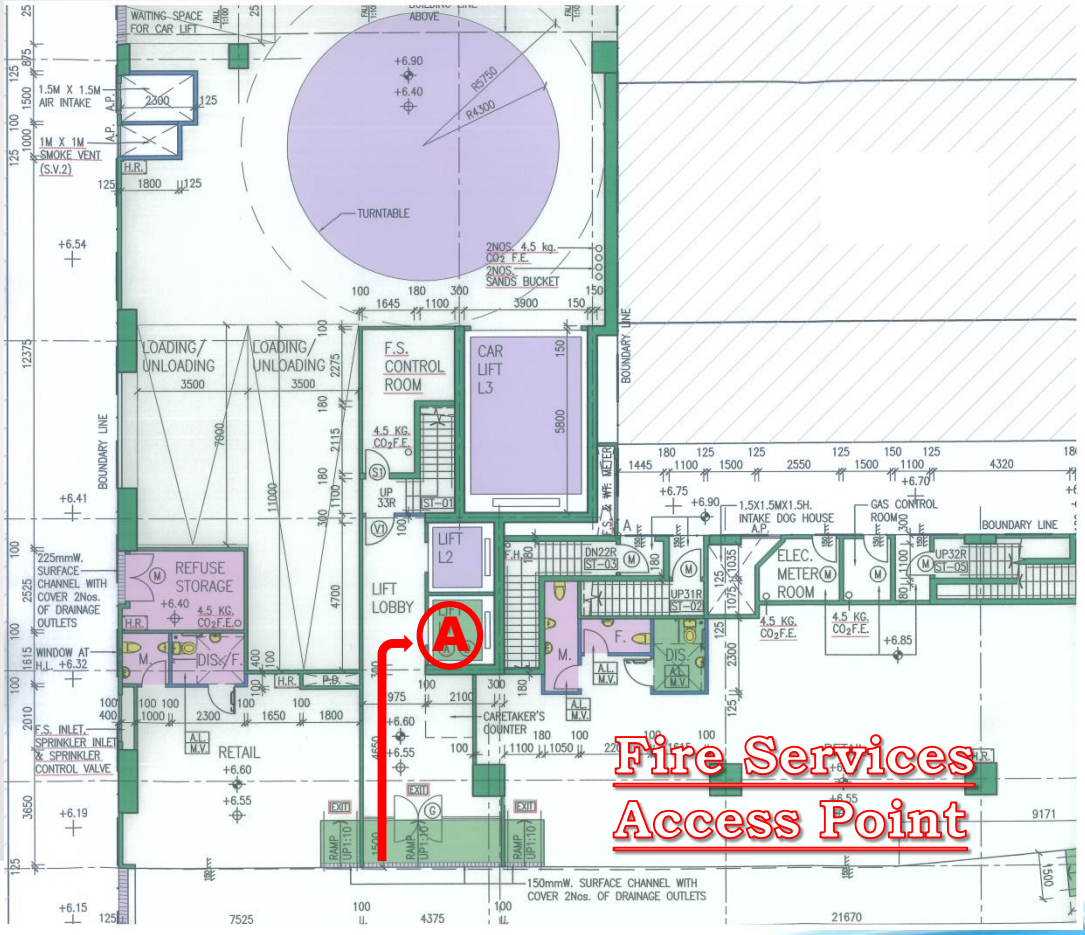
Fire Extinguisher

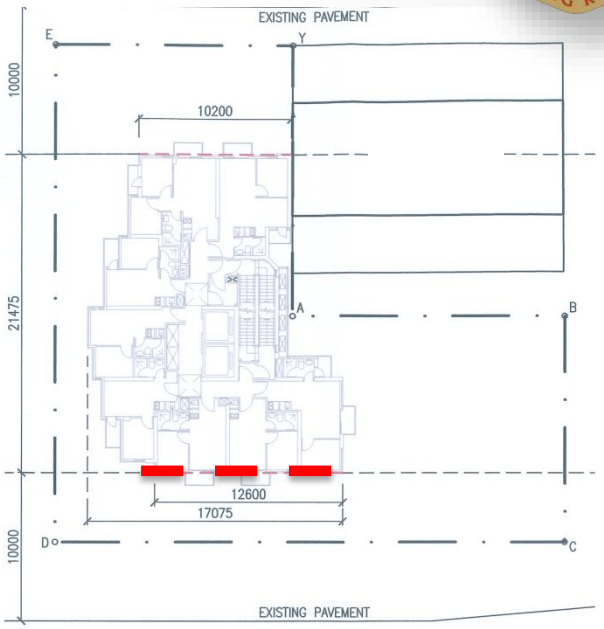
Hose Reel

F.S. Inlets Sprinkler Inlets & Control Valves

Information required in GBPs

(vi) Provisions of Means of Access (BD's jurisdiction)





E.V.A. DIAGRAM FOR TYPICAL (7/F–22/F)

DEMONSTRATION OF TOTAL LENGTH OF PERIMETER OF BUILDING AT TYP FLOOR

= 17.075 + 21.475 + 17.075 + 21.475

= 77.100 m

DEMONSTRATION OF PERIMETER [illegible] 10M OF E.V.A.

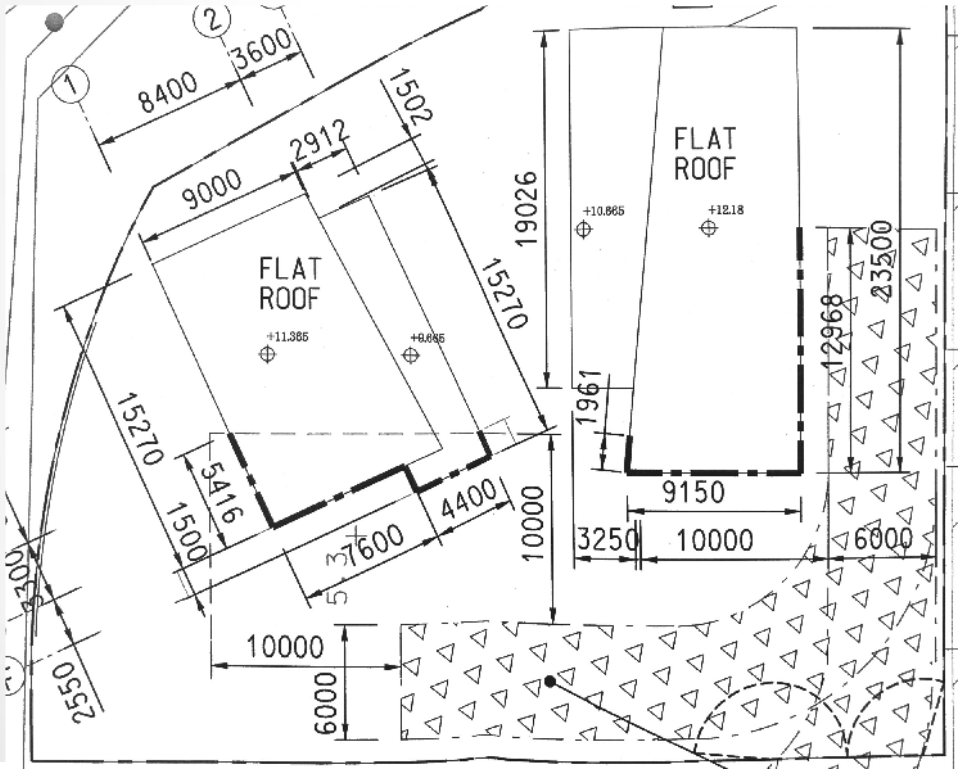
= 12.600 + 10.200 = 22.800

= 22.800 / 77.100 x 100% = **29.572%** > **25%**

EVA Plans

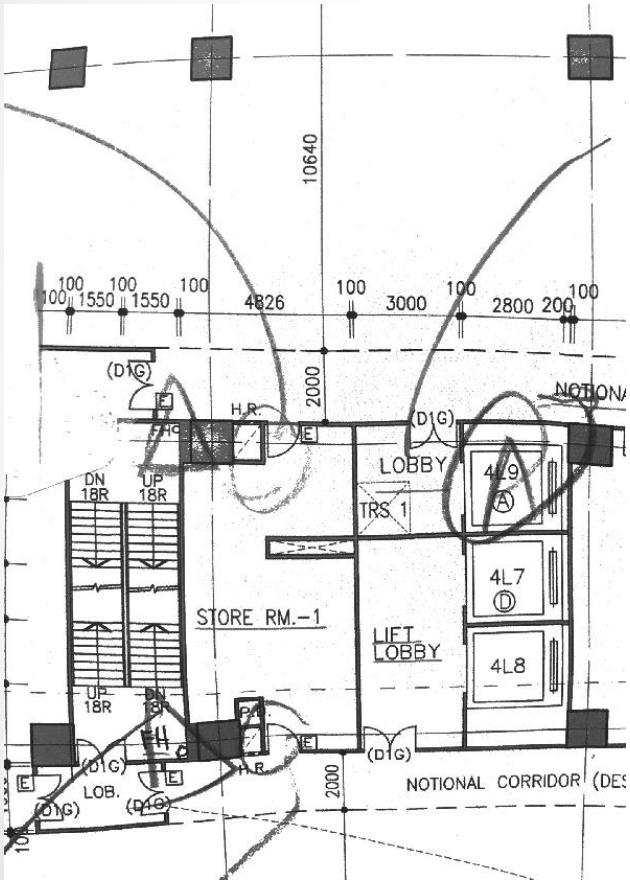
Common issues encountered

EVA:



- Width of EVA < 7.3 m
- Omission of emergency crash gates
- EVA specification not shown
- Façade served by EVA was not calculated floor by floor
- EVA calculation not correct

Common issues encountered



Means of Access:

- Lobby to a fireman's lift does not have a protected access to an exit route
- Width of FSAP < 1.5m
- FSAP closed with doors or gates not readily openable without the use of a key
- Actual walking distance from FSAP to the doors of the fireman's lift > 18m
- Pattern of service of fireman's lift is irregular

Problems in FSI Provisions

Water supply:

- FS Notes:- Street Fire Hydrant System shall be provided for the development.

  - Pump, Tank & Private SFH (Not from WSD)
- SFH were not 100 m staggered on alternative sides along EVA
- Distance between nearest SFH and the far most FS inlet >100 m (measured by hose laying distance)
- Location of SFH pump was not shown
- Size of a single SFH tank < 245 m^3

Problems in FSI Provisions

Fire Hydrant/Hose Reel system (FH/HR):

- Fire hydrants - not provided to every s/c
- Hose reel – insufficient coverage
- FS tank - undersized
- Inlet – not in a prominent position
- Tank size in FS Notes not tally with tank size shown in plans
- Share use of system
- Standard missing (FSD Circular Letter 2/2013)

Problems in FSI Provisions

Sprinkler system:

- Incomplete standard (LPC Rules incorporating BS EN 12845:2003 and the FSD Circular Letter 3/2006 & 3/2012)
- Inappropriate tank size and hazard group
- Reduced tank size but NO direct link to FSCC
- FRT sprinkler are not provided in B/F
- Tank size in FS Notes not tally with tank size shown in plans
- No pre-approval for alternative provisions, e.g.:
  - Improvised sprinkler
  - Omission of sprinkler in floor/ceiling void

Problems in FSI Provisions

Fire detection system:

- Incomplete standard (BS 5839 Part 1:2002 + A2:2008 and the FSD Circular Letter 1/2009, 3/2010 & 2/2012)
- Panel location - not indicated on plans

Problems in FSI Provisions

Other FSIs:

- Emergency lighting
  - throughout the entire building and all exit routes leading to ground level in accordance with BS 5266: Part 1 and BS EN 1838
- Exit sign
  - ensure that all exit routes from any floor within the building are clearly indicated as required by the configuration of staircases serving the building in accordance with FSD Circular Letter 5/2008
- Fire Control Centre
  - F.S. Control Room
  - Location not at the main building entrance

Problems in FSI Provisions

Other FSIs (Con't):

- Smoke extraction system
  - reason for non-provision not tally with the fact
    - Fire compartment less than 7,000m3
    - Openable windows > 6.25% of the floor area
    - the designed fire load - Low, e.g. office, school, etc.
- Staircase Pressurization

  - standard missing (BS 5588: Part 4 1998)

  - reason for non-provision not tally with the fact
    - natural venting of staircase (BS 5588: Part 5 1991)
    - Openable windows > 6.25% of the floor area
    - the designed fire load of the building is low, e.g. NO shops, restaurant, loading/unloading area

FS notes Standardization

FS Notes:

Clear

- 3 nos. of FH/HR system shall be provided to the entire development
- (1 no. for Tower A, 1 no. for Tower 2 & 1 no. for Podium Floor)

Simple

- No redundant statement
- FH/HR system shall be provided in accordance with CoP
- Fixed fire pumps for FH/HR shall be of 450 l/min at a running pressure of not less than 350kPa

Logical

- No Fire Detection System shall be provided for the domestic towers
- Fire detectors shall be provided for domestic units with open kitchen

(C.S.L.)

FS notes Standardization

FS Notes:

1. ***System***
2. ***Standard***
3. ***Location***
4. ***Layout plan***

(S.S.L.L.)

FS notes Standardization

Sprinkler System

An automatic sprinkler system (S) shall be provided in accordance with the LPC Rules incorporating BS EN 12845:2003 and the FSD Circular Letter 3/2006 & 3/2012 (S) in all parts of the buildings including staircases, common corridors and toilets except E&M plant rooms and areas approved by FSD in letter ref. (XX) in FP 8/XXXXX dated XX.XX.XXXX (L)

(L) – Spr Tank, Pump, Inlets, etc.

- Hazard group
- Tank size
- Direct telephone line to FSCC

FS notes Standardization

Fire Hydrant/Hose Reel System

Fire Hydrant/Hose Reel System (S) shall be provided in accordance FSD CoP and FSD Circular Letter 2/2013 (S) for the entire building (L)

(L) - FS Tank, Pump, Inlets, etc.

- Tank size
- Intermediate booster pump

FS notes Standardization

Fire Detection System

Fire detection system (S) shall be provided in accordance with BS 5839 Part 1:2002 + A2:2008 and the FSD Circular Letter 1/2009, 3/2010 & 2/2012 (S) for all E&M plant rooms and in areas not covered by automatic fixed installations except areas approved by FSD in letter ref. (XX) in FP 8/XXXXX dated XX.XX.XXXX (L)

(L) – Panel location

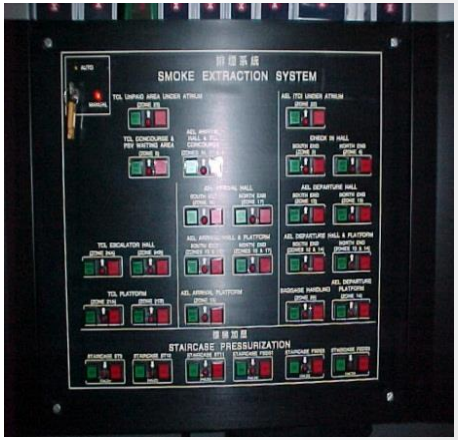
- Direct telephone line to FSCC

FS notes Standardization

Smoke Extraction System (Non-provision)

Smoke extraction system **shall NOT be provided** to *compartment _____ as

- *compartment of the atrium does not exceed 28,000 m^3 /
- fire compartment does not exceed 7,000 m^3 /
- openable windows > 6.25% of the floor area of that compartment



Tally with plans and facts

Measures to increase efficiency

- Submit GBP (up to FSD standard)
- Avoid lots of amendments in GBP since PO often needs to sacrifice extra plan processing time to advise and review AP's amendments
- Highlight all the amendments in the amended plans
- Avoid submission of redundant enquiries (e.g. Pre GBP submission enquiry)

Frequent Asked Enquiry

Redundant Enquiry

- Exemption for Remote Indicator for Detectors
- Exemption of Spr at Canopy
- Pre-GBP submission enquiry regarding FSI and EVA provision
- etc.

Fire Engineering Approach (FEA)

Fire Engineering Approach

Fire Safety Solution

- Scientific and engineering principles
- Rules
- Expert judgment

Based on

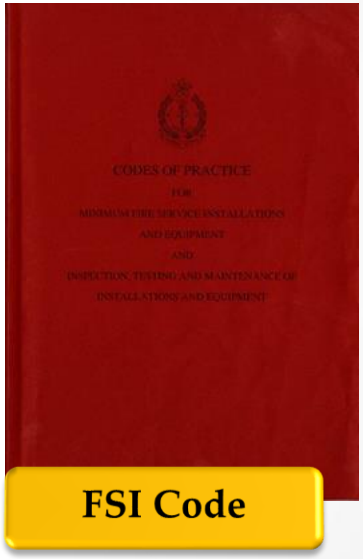
- Phenomena and effects of fire
- Reaction and behaviour of people to fire

Fire Engineering Approach

Para 1.3

Discretionary powers of the Director of Fire Services

For buildings of special designs or hazards which necessitate special considerations, the Director of Fire Services may accept, on a case by case basis, **fire engineering approach** as an alternative to the prescriptive provisions provided that the fire engineering approach **shall not** provide a level of safety **inferior to** that provided by **prescriptive requirements**.



Fire Engineering Approach

Adopted when:

Genuine difficulty in code compliance

Difficulties

- Building size
- Usage
- Complexity
- Location

Re-issued under new categorization in August 2009 as Practice Note for Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers APP-87

Buildings Department	Practice Note for Authorized Persons and Registered Structural Engineers	204

Guide to Fire Engineering Approach

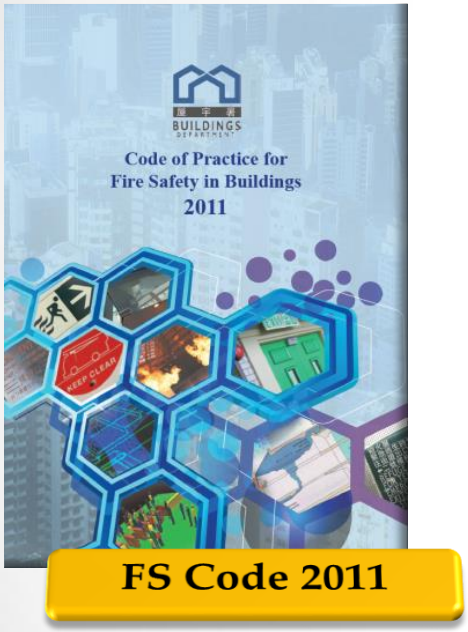
This practice note provides guidance on fire engineering approach for the design of new buildings or alteration and addition works in existing buildings to meet the fire safety objectives and performance requirements of Building (Construction) Regulation 90, Building (Planning) Regulations 41, 41A, 41B & 41C and as an alternative to the prescriptive requirements set out in the three Codes of Practice for Means of Escape, Means of Access for Firefighting and Rescue and Fire Resisting Construction, covering fire safety in buildings.

Objectives

2. Fire engineering design offers a flexible alternative where it is impracticable to comply with prescriptive provisions in the Codes, especially when designing for special or large and complex buildings or alteration and addition works in existing buildings. The aim is to provide for an overall level of safety that is equivalent to that which would result if fire safety was achieved through full compliance with the prescriptive provisions of the relevant codes of practice. The acceptability of fire engineering approach is recognised in paragraph 3 of the Codes. Fire engineering design provides a framework for practitioners to demonstrate that the performance requirements of legislation are met, or in some cases bettered, even though some of the design solutions adopted fall outside or short of the prescriptive provisions in the Codes when additional fire safety measures are proposed to compensate for the deviation or shortfall.

3. To achieve this objective it is important to understand the performance requirements and the prescriptive provisions that are required as a minimum to comply with the legislation. If the design being considered is not substantially different from the prescriptive provisions or can be readily accommodated by adopting conservative assumptions, it may simply be a case of demonstrating like-for-like substitution or "equivalence" with prescriptive provisions and fire safety objectives without having to embark on a full fire safety strategy. However, practical test may be required where necessary to demonstrate the equivalence by practitioners.

Fire Engineering Approach



Part G – Guidelines on Fire Engineering

Section 1 – Introduction
Section 2 – Framework for Fire Engineering
Section 3 – Introduction to Fire Engineering
Section 4 – Methodologies of Fire Engineering
Section 5 – Fire Safety Sub-systems
Section 6 – Design by Fire Engineering
Section 7 – Fire Safety Assessment Report
Section 8 – Bounding Conditions
Section 9 – Computer Models
Section 10 – References

Fire Engineering Approach

Fire Safety Committee

Composition

Chairman

AD/NB1, Buildings Department

Official Members

- Case Officer — CBS/NBD1, BD
- Non-case Officer — CBS/NBD1, BD (on rotational basis)
- Non-NBD1 CBS — CBS from other divisions (on rotational basis)
- CSE — CSE/NBD2, BD (on rotational basis)
- **SDO(NP)**

Non-official members (on rotational basis)

- Authorized person
- Fire safety practitioner
- Fire safety expert from academia

Fire Engineering Approach

Changes in **GBP** may need corresponding adjustment of approved **FER** as well as **FSMP** and vice versa.

Thank You