FSD Connects with Construction Industry

Experience Sharing on Acceptance Inspection, Maintenance, Modification and Repair of FSI

11 JUNE 2019

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Welcoming Address

Assistant Director

(Licensing and Certification)

Ir LEUNG Kwun-hong

OBJECTIVES

- Facilitate the trade in meeting the standards of fire safety design and FSI in buildings
- Foster swift processing of GBP and efficient acceptance inspection of FSI
- Strengthen connectivity, collaboration and partnership with the trade

Contents

1015 – 1045	➢ Experience Sharing on Acceptance Inspection of FSI
1045 – 1100	➢ Experience Sharing on Installation, Inspection and Maintenance of FSI
1100 – 1130	➢ Overview and Experience Sharing FSI Plans (FSI/314A) Submission
1130 – 1145	➢ Efficient Design of Staircase Pressurization System
1145 – 1215	Q&A

Summary of Past Seminars
FSD connects with the Construction Industry

	24.11.2017	25.6.2018	23.11.2018
Processing of Building Plans	✓		
Submission of FSI/501 and FSI/314	✓	✓	
Experience Sharing on FSI Acceptance Inspection	✓	✓	✓
Material Acceptance		✓	
Facilitation Measures taken for FSI Acceptance Inspection	✓	✓	✓
Open Kitchen Unit and Window-less Kitchen/Toilet			✓

Facilitation Measures

Pre-inspection meeting with AP and FSIC ☑

- Preliminary Document Checking
- Coordination of inspection schedule

Facilitation Measures

Standard Document Checklist ☑

- For consistency of FSI acceptance inspection
- Launched since 8 Jan 2018

Facilitation Measures

Advisory Letters to FSIC ☑

- Issued on Nov 2017 and Jun 2018 regarding Application for Acceptance Inspection of FSI

Document submission of FSI/314 for Smoke Control ☑

- Consent Form launched and uploaded onto FSD Website on 23.9.2018

Facilitation Measures

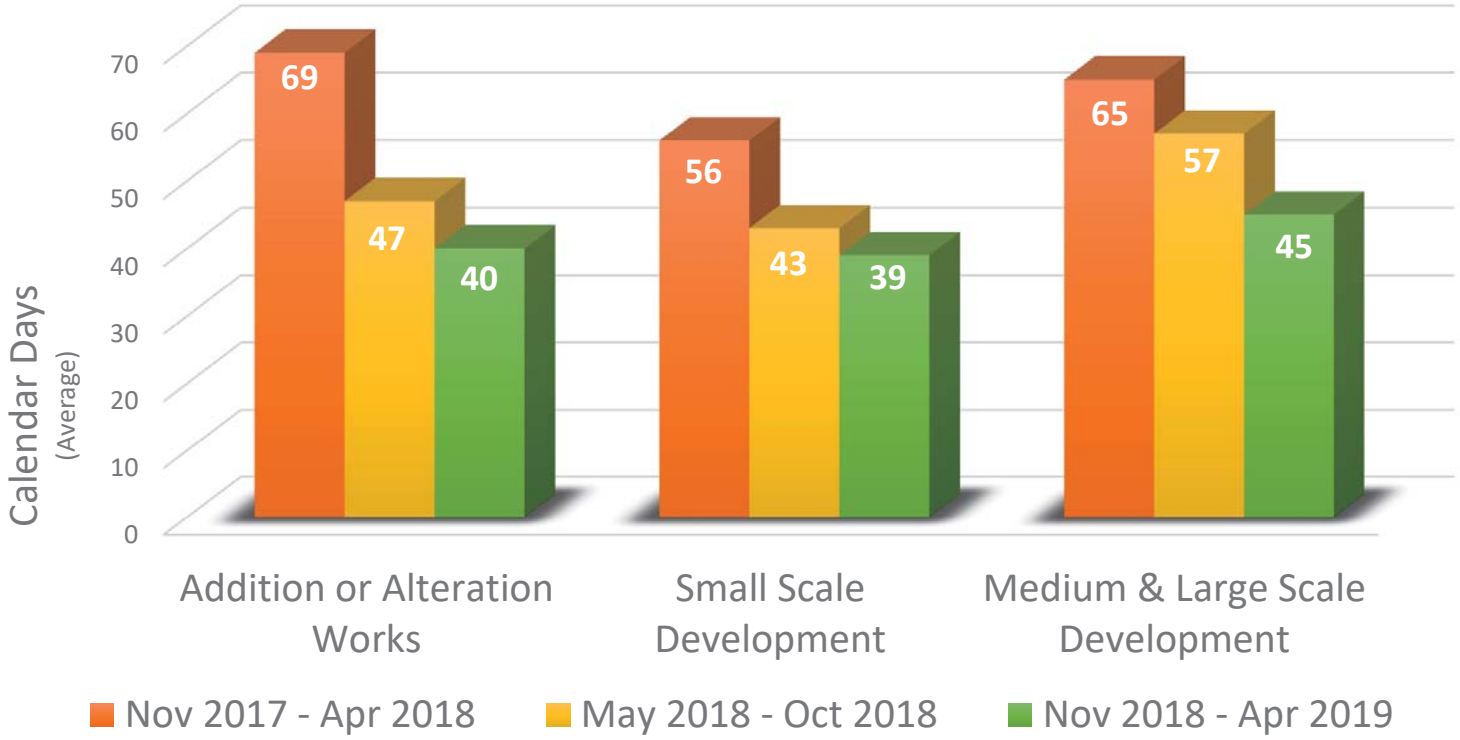
Conduct various seminars to the trade, Institutions and Government Departments ☑

- HD, HKIA, FSIC, HKIS & HKIE, etc.
- 5 Seminars were held from Nov 2017 to May 2019

Upload Videos and PowerPoints onto FSD website ☑

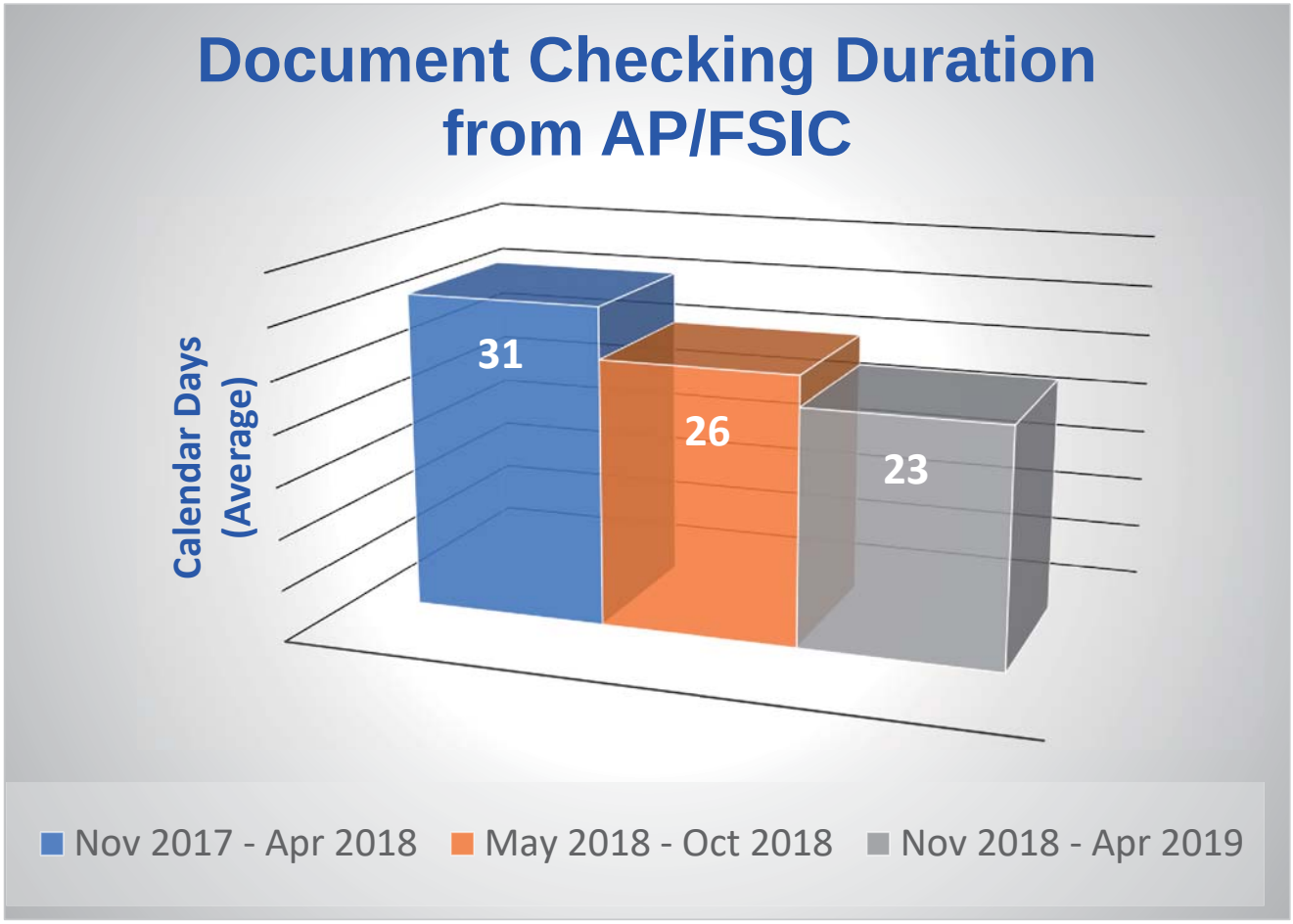
Analysis of the Effectiveness of the New Implemented Measures from 1.11.2017 to 30.4.2019

Summary of Duration for Issue of FS172



*Among Cases **without** re-inspection

Analysis of the Effectiveness of the New Implemented Measures from 1.11.2017 to 30.4.2019



Analysis of the New Implemented Measures

Medium & Large Scale Development
(Single building more than 6 storey or multiple buildings)

On-site Inspection

5 Days

Document Checking

- Amendment of documents
- Amendment of GBP & FSI/314
- Submission of relevant supporting documents

29 Days

Estimated 34 Days

*Among Cases **without** re-inspection

Analysis of the New Implemented Measures

Case 1

Building Description:

A 13-storey commercial and a 12-storey commercial building on top of a 4-level podium used as offices, restaurants, carpark and plant rooms

On-site Inspection

11 Days

EL, ES, EG, PE, FH/HR, Spr, FDS, MFA, VFA, AVAS, VAC, **SPS**, Sprinkler, EVA

Document Checking

24 Days

35 Days

Analysis of the New Implemented Measures

Case 2

Building Description:
A residential development comprising two 18-storey domestic buildings and one 2-storey clubhouse

On-site Inspection

2 Days

Document Checking

8 Days

10 Days

Correct & valid Documents/Drawings

Hints on Smooth FSI Acceptance Inspection

Please strictly observe the procedure and requirement in FSD Circular Letter No. 1/2015

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Experience Sharing on Acceptance Inspection of FSI

Engineer(FSI)

Ir Peter LAW

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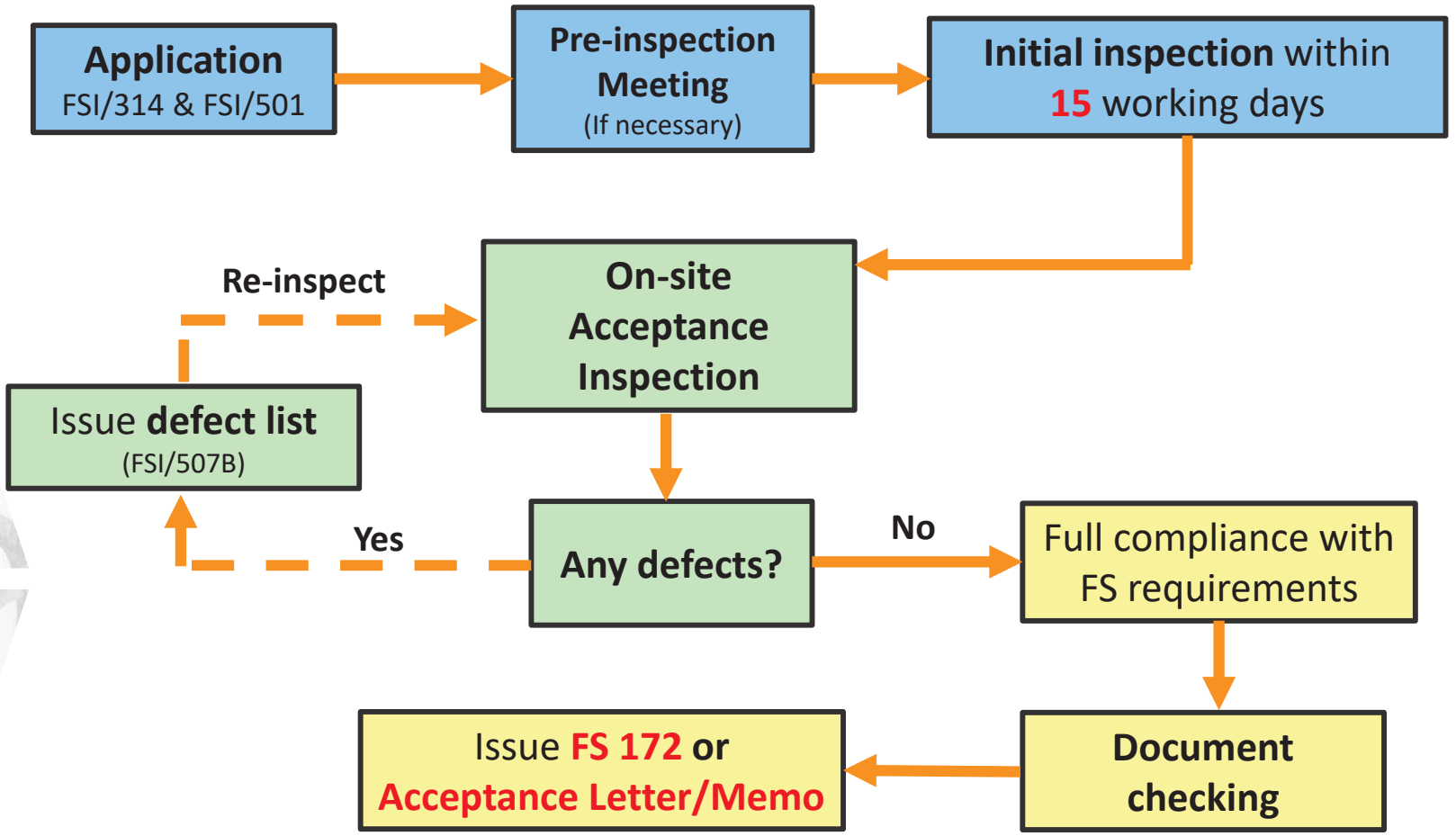
Analysis of FSI Acceptance Inspection

FSD Circular Letter No. 1/2015

- Form FSI/501 : Application Form
- Form FSI/314 with two sets of as-fitted FSI layout plans*
- Testing and Commissioning (T&C) Checklists
- FSIs Equipment List & relevant supporting documents
- Document submission for FSI Equipment

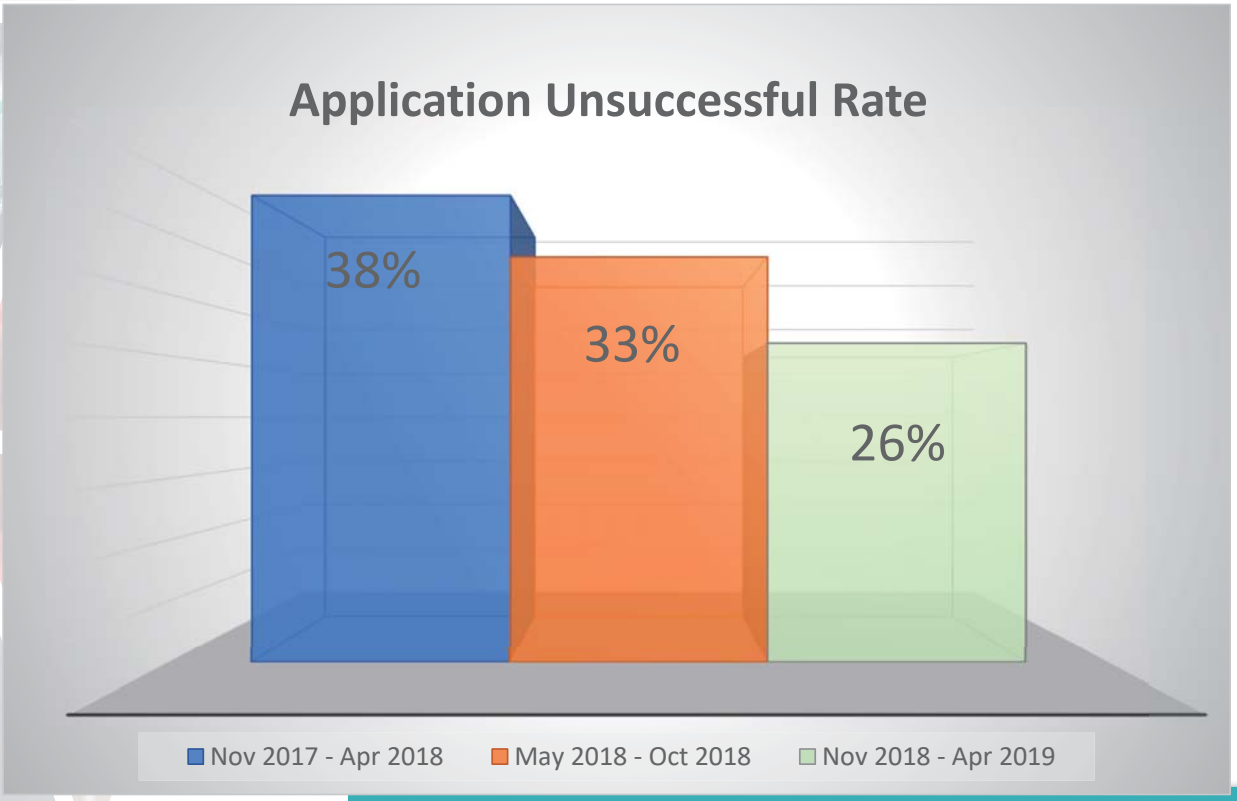
*Remarks: FSI/314 drawings for Smoke Control Systems required prior approval

Workflow for FSI Acceptance Inspections



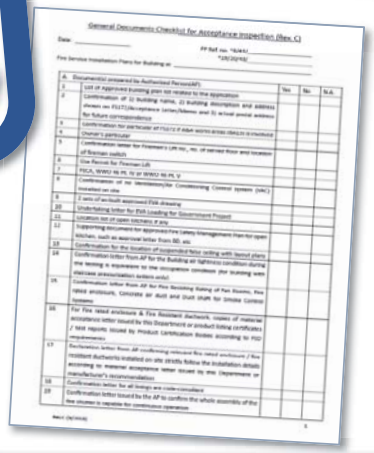
Rejection + Withdrawal of FSI/501 Application

- Facilitation Measures taken since seminar on Nov 2017
- Application Unsuccessful reduced from 38% to 26%



Pre-inspection Meeting

Document Checklist



Analysis of FSI Acceptance Inspection

Summary of Analysis of 117 Cases of **Addition or Alteration Works**

(e.g. BA13)

Item	Descriptions (Nos./%)	Duration between Receipt of FSI/501 and Issue of FS172	Distribution of time	
			FSD	**AP/RFSIC**
		Average Calendar day	Average Calendar day (%)	Average Calendar day (%)
1	Cases WITHOUT Re-inspection [84 Cases (72%)]	55	**25 (42%)**	**30 (58%)**
2	Cases With 1 Re-inspection [28 Cases (24%)]	109	**27 (25%)**	**82 (75%)**
3	Cases With 2 Re-inspection [5 Cases (4%)]	125	**28 (22%)**	**97 (78%)**

*** Blue colour – Time taken by FSD**

*** Red colour – Time taken by AP/RFSIC**

Analysis of FSI Acceptance Inspection

Summary of Analysis of 150 Cases of **Small Scale Development**

(Single building no more than 6 storey)

Item	Descriptions (Nos./%)	Duration between Receipt of FSI/501 and Issue of FS172	Distribution of time	
			FSD	**AP/RFSIC**
		Average Calendar day	Average Calendar day (%)	Average Calendar day (%)
1	Cases WITHOUT Re-inspection [95 Cases (63%)]	48	**24 (50%)**	**24 (50%)**
2	Cases With 1 Re-inspection [45 Cases (30%)]	89	**26 (28%)**	**63 (72%)**
3	Cases With 2 Re-inspection [10 Cases (7%)]	130	**25 (19%)**	**105 (81%)**

*** Blue colour – Time taken by FSD**

*** Red colour – Time taken by AP/RFSIC**

Analysis of FSI Acceptance Inspection

Summary of Analysis of 200 Cases of **Medium & Large Scale Development**

(Single building more than 6 storey or multiple buildings)

Item	Descriptions (Nos./%)	Duration between Receipt of FSI/501 and Issue of FS172	Distribution of time	
			FSD	**AP/RFSIC**
		Average Calendar day	Average Calendar day (%)	Average Calendar day (%)
1	Cases WITHOUT Re-inspection [93 Cases (47%)]	54	**26 (48%)**	**28 (52%)**
2	Cases With 1 Re-inspection [84 Cases (42%)]	84	**27 (32%)**	**57 (68%)**
3	Cases With 2 Re-inspection [17 Cases (8%)]	106	**29 (27%)**	**77 (73%)**
4	Cases With 3 Re-inspection [6 Cases (3%)]	180	**30 (17%)**	**150 (83%)**

*** Blue colour – Time taken by FSD**

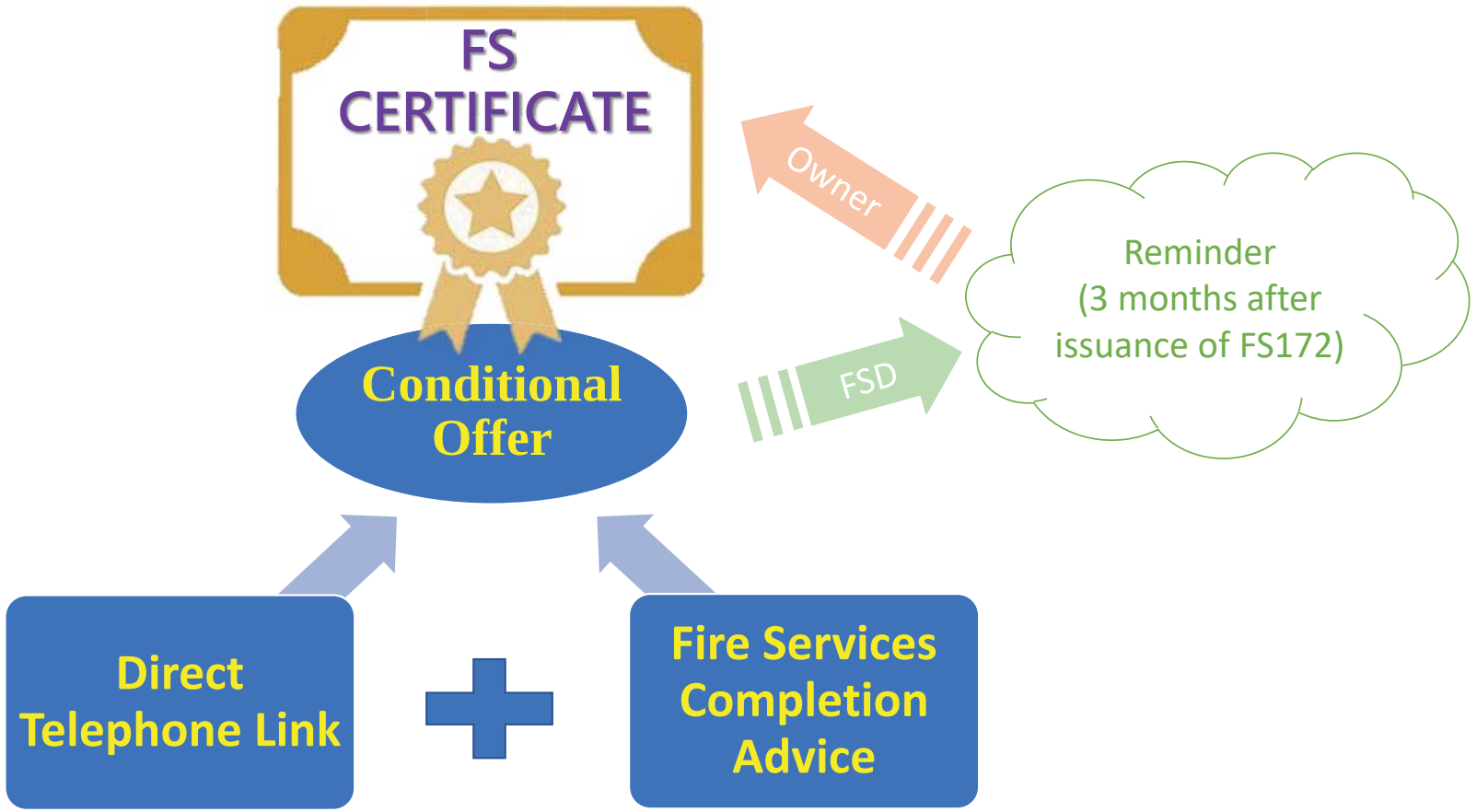
*** Red colour – Time taken by AP/RFSIC**

Analysis of FSI Acceptance Inspection

If re-inspection required, overall duration is much longer….

Type of Project	*Average Duration between Receipt of FSI/501 and Issue of FS172*		
	Addition or Alteration Works (e.g. BA13)	Small Scale Development (Single building no more than 6 storey)	Medium & Large Scale Development (Single building more than 6 storey or multiple buildings)
	Average Calendar Day	Average Calendar Day	Average Calendar Day
One Take	**55**	**48**	**54**
Cases With 1 Re-inspection	**109 (+54)**	**89 (+42)**	**84 (+30)**
Cases With 2 Re-inspection	**125 (+70)**	**130 (+83)**	**106 (+52)**
Cases With **3** Re-inspection			**180 (+126)**

Riders on FS 172 Certificate - DTL & FSCA



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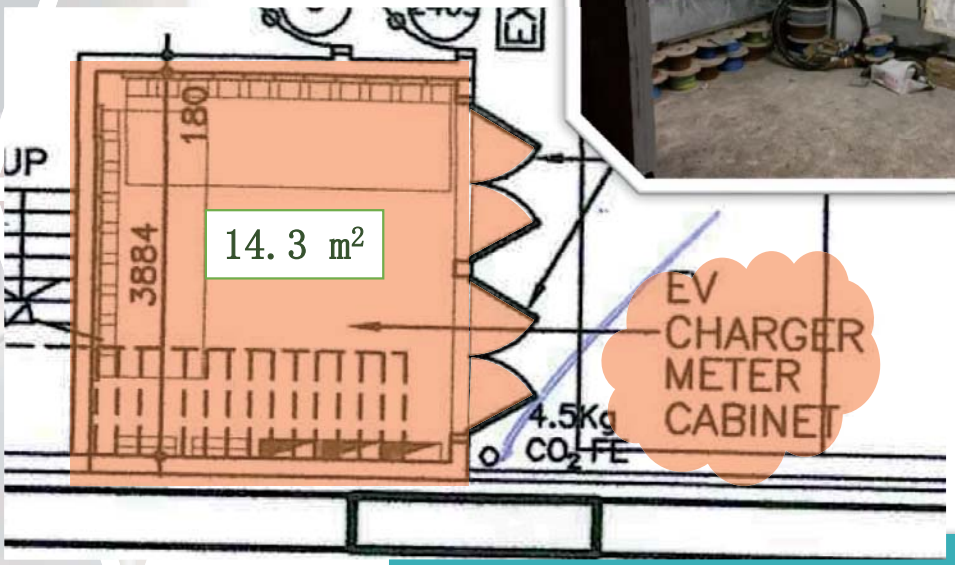
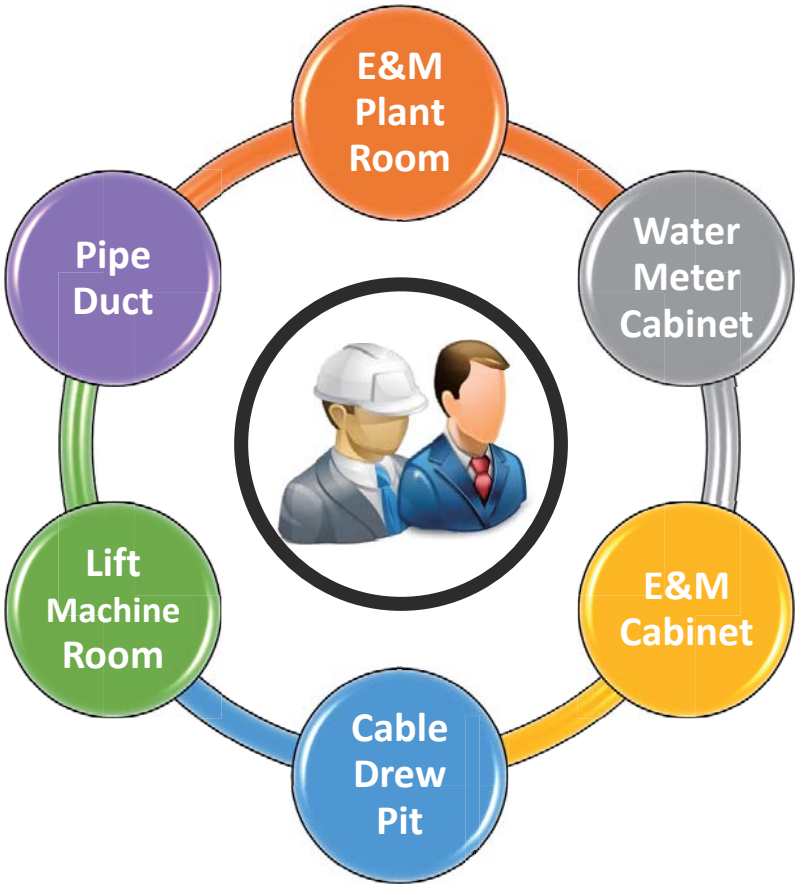
Case Sharing on Irregularities and Observations

Case Sharing

➢ Fire Safety in Pipe Duct and E&M Cabinets

Case (1):
EV Charger Meter Cabinet

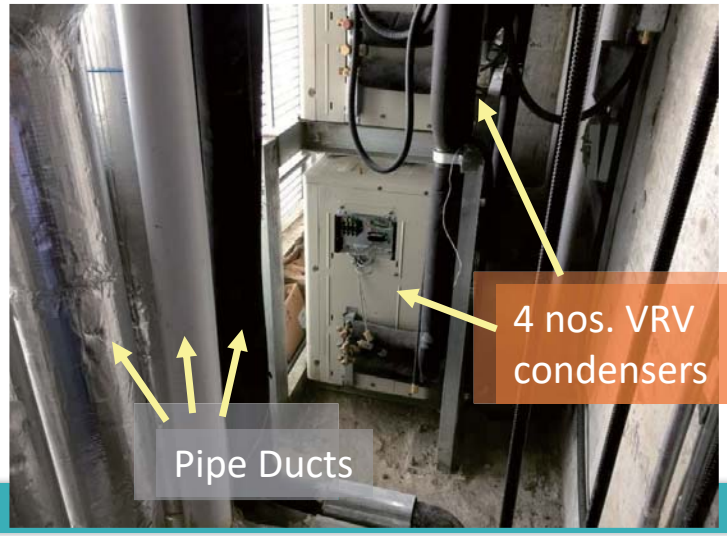




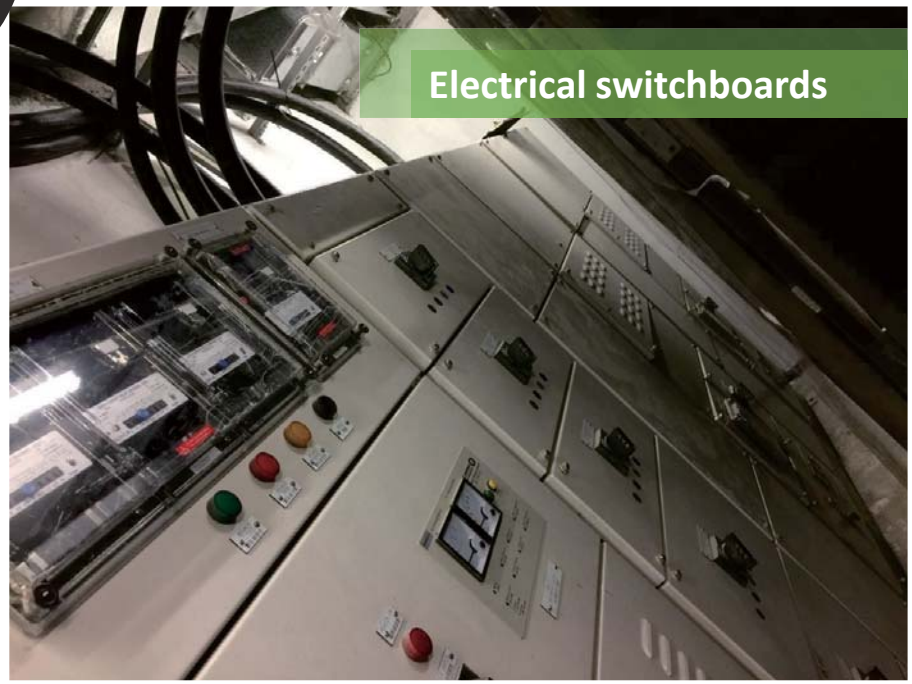
Case Sharing

➢ Fire Safety in Pipe Duct and E&M Cabinets

Case (2): Pipe Duct



Case (3): Electrical Cabinet



Testing and Commissioning before Application

Testing and Commissioning

Application FSI/314 & FSI/501

On-site Inspection

Any Defects?

Re - Inspection

IMPORTANT

Case Sharing

- Emergency Vehicular Access(EVA)

Signage for EVA should be properly **erected** and **fixed** to indicate the extent of the designated EVA

Case Sharing

- Fire Hydrant / Hose Reel Systems

Fire hydrant outlet obstructed by building structure

Case Sharing

- Fire Hydrant / Hose Reel Systems

The static pressure at Hydrant Outlet exceeded 850 kPa

Case Sharing

- Exit Sign

Exit and directional signs shall be positioned directly above the doorway of the exit

Case Sharing

- Poor FSI Condition

Case Sharing

- Poor FSI Condition

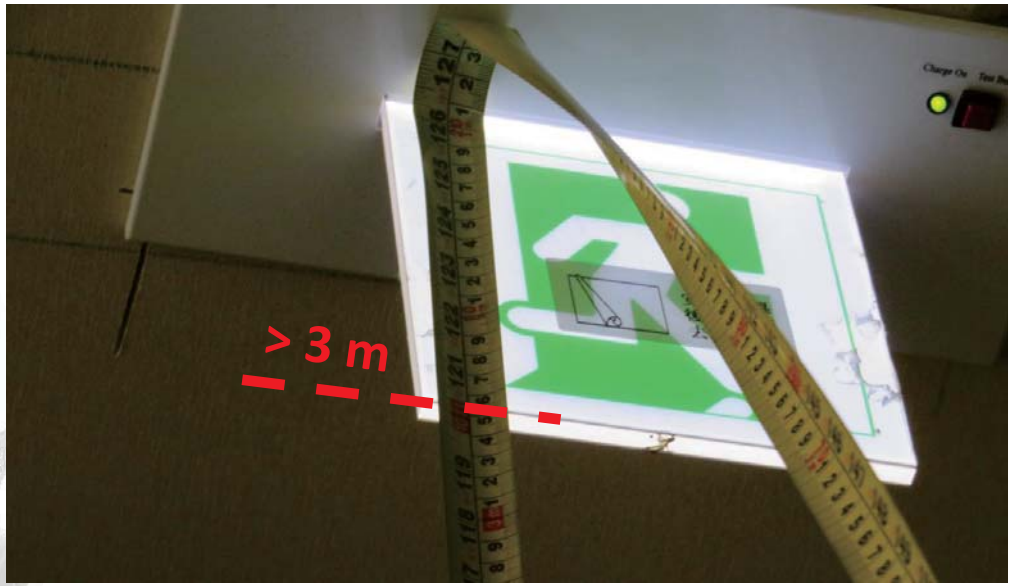
Sprinkler head and detector were blocked

Case Sharing

- Poor Painting and Plastering Works

Case Sharing

- Improper Installation of FSI



Exit and directional signs shall be positioned between 2 m and 2.5 m above floor level

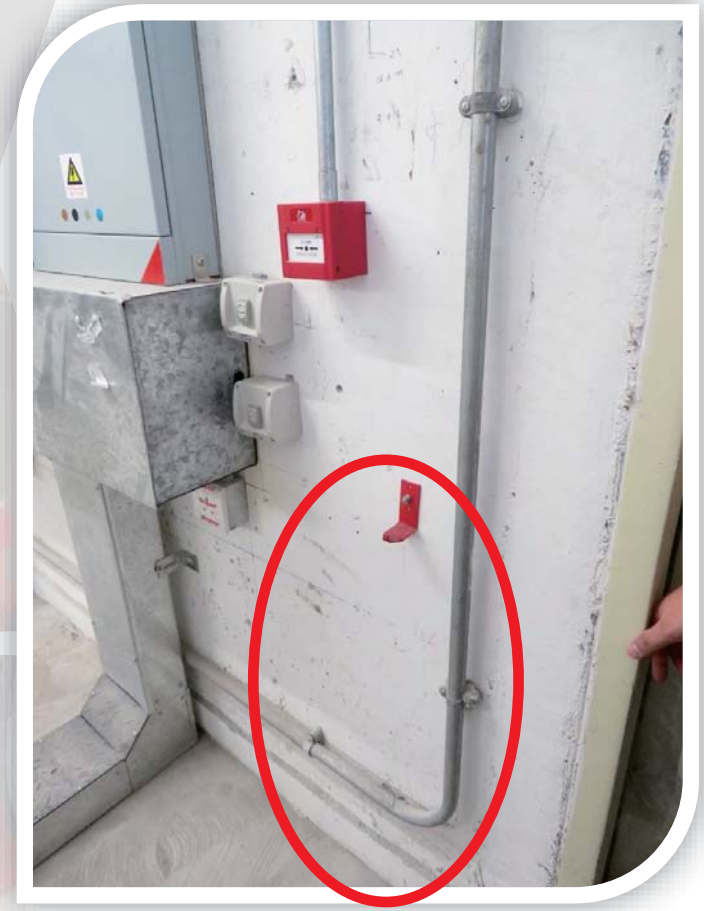
Case Sharing

- Incomplete Building works

Case Sharing

- Poor Site Readiness for inspection

Testing and Commissioning Done Properly???



- Incomplete Installation of FSI

Undesirable Testing and Commissioning

Poor Testing and Commissioning may result in :

- Re-inspection on FSI
- Prolonged FSI Acceptance Inspection
- Investigation of any unscrupulous practice

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Acceptance Inspection on Smoke Extraction System (SES)

Measurement of Extraction Rates

(5.23, Part V, Codes of Practice for Minimum Fire Service Installations and Equipment, April 2012)

Pre-approval of Smoke Control Systems (SCS*)

- **FSD approves only the design principle of the SCS***
- **AP and RFSIC shall ensure:**
  - the design comply with relevant design criteria as stated in approved system
- **Given the different configuration and layout of every case, which would not set as a precedent to others**

* *SCS includes Smoke Extraction Systems, Ventilation/Air conditioning Control Systems and Staircase Pressurization Systems*

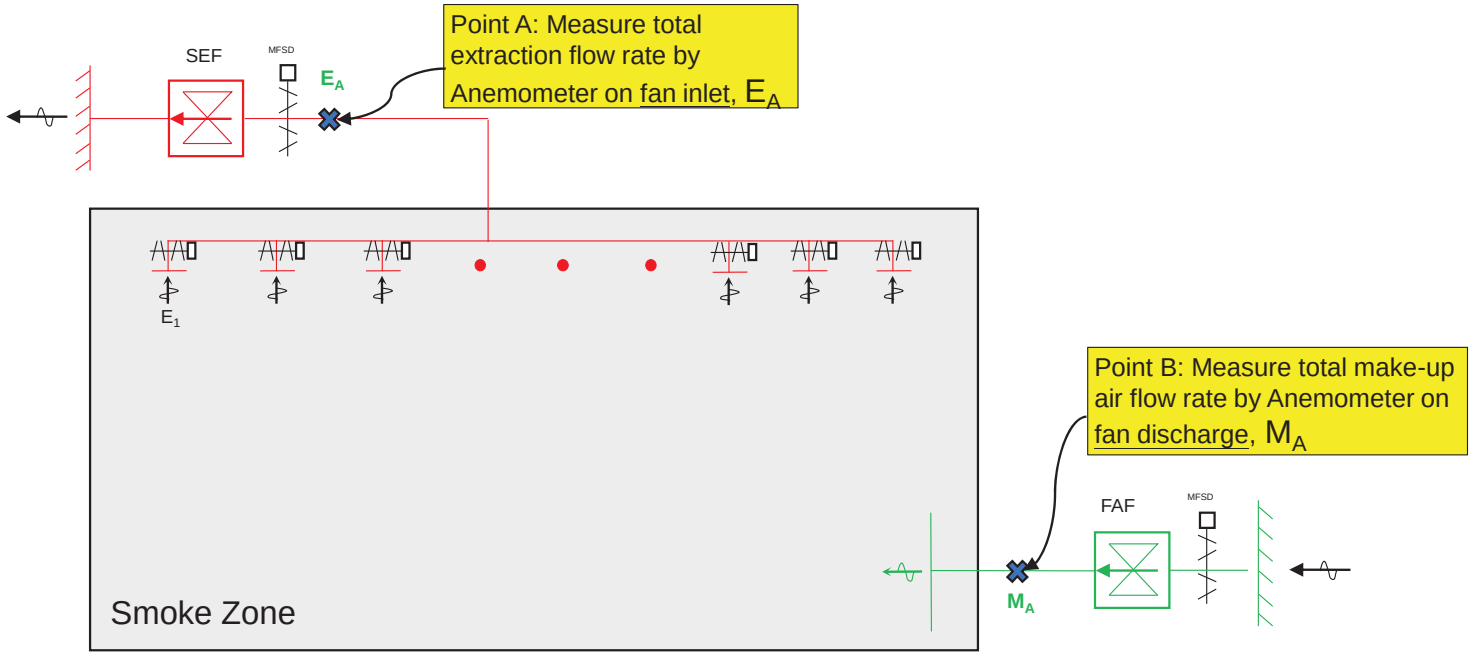
(1) Total Extraction Rate

Acceptance Criteria

① $E_A \approx$ Design smoke extraction rate;

② $M_A >= 80\%$ of E_A

③ Measured airflow rate shall match with data stated in the test report

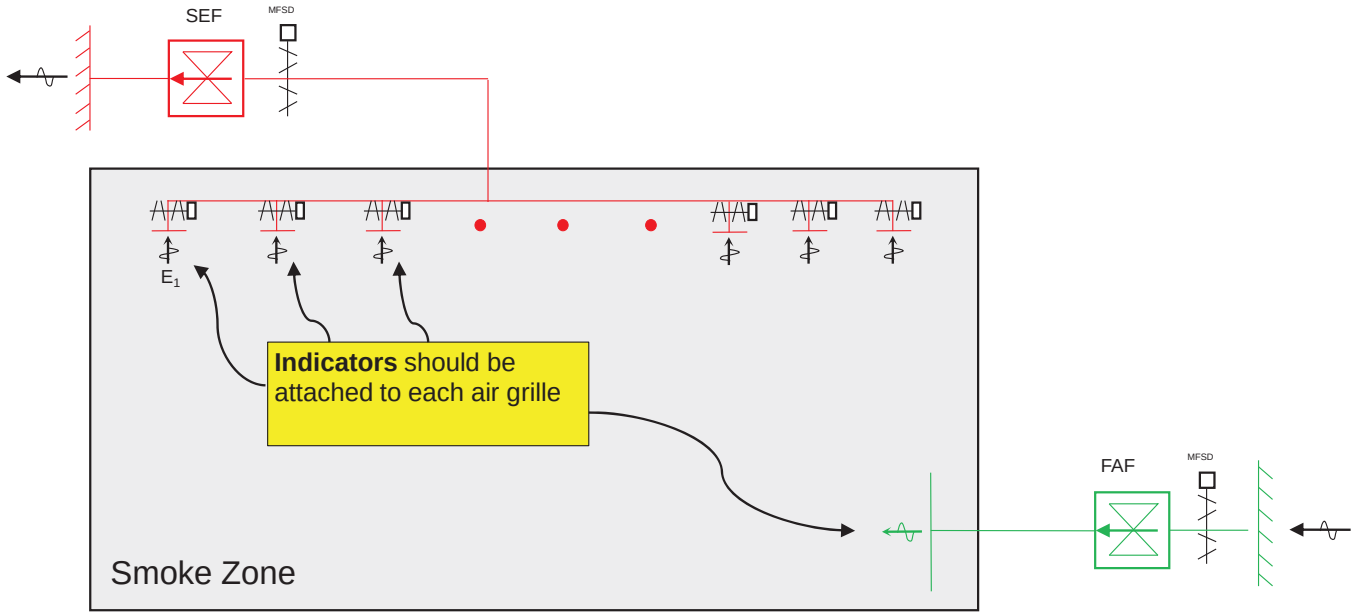


(2) Air-flows Directions

Acceptance Criteria

① All extraction air grilles with correct air-flow

② All make-up air grilles with correct air-flow



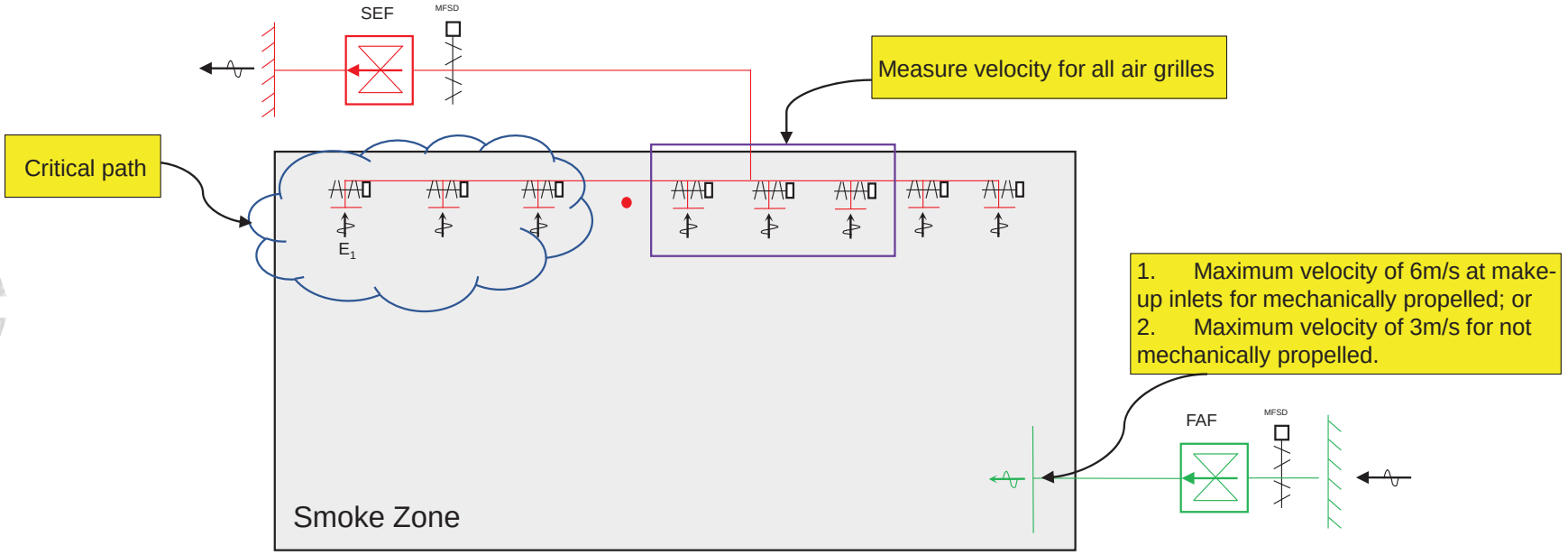
(3) Average Velocity

Acceptance Criteria

① Measured airflow rate shall match with data stated in the test report

② $E_{i=1}^{n} \leq 6m/s$

③ $M_A \leq 6m/s$, where mechanically propelled or $M_A \leq 3m/s$, where not mechanically propelled.



(4) Test Record and Hot Smoke Test

Full set of test and function operation check records with signed by RPE

Hot Smoke Test, if required:-

① Compartments with headroom >= 12m; or

② Compartments with irregular geometrical dimension of extraordinary large size

(FSD Circular Letter No. 2/2002 Hot Smoke Test on Smoke Extraction System)

Way Forward

- Continue the pre-inspection meeting
- Review the document checklist regularly
- Conduct briefing to the trade for better communications
- Upload Video and PowerPoint onto FSD website
- Review and streamline the acceptance inspection process

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Experience Sharing on Installation, Inspection and Maintenance of FSI

DO(FSITF)
CHU Man-chiu

INTRODUCTION

Case Sharing

Guidelines on conducting Fire Safety Improvement Works

Case Sharing #1

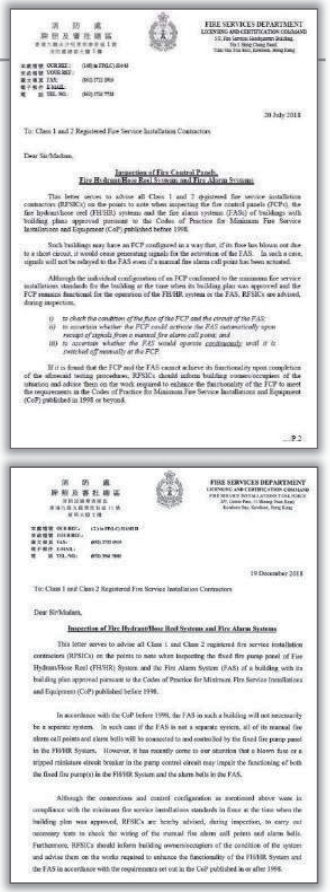
- No fire alarm sound was heard in the whole building during a fire incident
- Manual call points of fire alarm system were found actuated
- FS pump and intermediate booster pump of FH/HR system were found inoperative

Malfunction of Fire Control Panel

- FH/HR system and fire alarm system were incorporated with each other and controlled by a fire control panel (FCP)
- Miniature circuit breaker (MCB) / fuse of the fire control panel was tripped / blown out during the incidence
- Signals could not be relayed to alarm sounders and pumps under such circumstances

Proper Maintenance & System Enhancement

- FSI Owner
  - ✓ Appoint RFSIC for maintenance works
- RFSIC
  - ✓ Carry out necessary test including the checking of the wirings of manual call points and the fire alarm sounders
  - ✓ Advise FSI owners to enhance the functionality of the FCP
- Adhere to the FSD letters issued to RFSIC dated 20.7.2018 and 19.12.2018



Case Sharing #2

- Inadequate water pressure of FH/HR system experienced during firefighting
- The situation did not improve even feeding water via the FS inlets from fire appliance.

Malfunction of FS Inlet

- FS inlet was found inoperative

- water supply into the FH/HR systems via the FS inlets was blocked resulting failure of back up water supply from fire appliance

Proper Maintenance

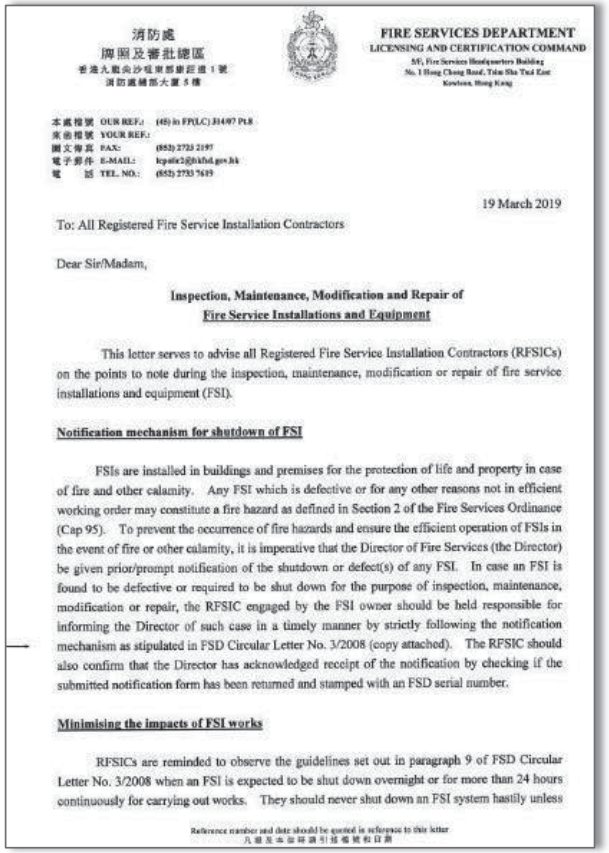
- Systems commissioned for a long time may sustain wearing and tearing

- Duties of RFSIC:

  test and lubricate the moving parts of FSI Systems (e.g. FS inlets, control valves, etc.) during maintenance

Points to Note for FSI Shutdown

- Notification mechanism for shutdown – confirm with acknowledged receipt and FSD serial number
- Minimising the impacts of FSI works – shut down by sections & avoid prolonged shutdown
- Adhere to the FSD letter issued to RFSIC dated 19.3.2019 & FSD C/L No. 3/2008



消防處
牌照及審批總區

FIRE SERVICES DEPARTMENT
LICENSING AND CERTIFICATION COMMAND

19 March 2019

To: All Registered Fire Service Installation Contractors

Dear Sir/Madam,

Inspection, Maintenance, Modification and Repair of Fire Service Installations and Equipment

This letter serves to advise all Registered Fire Service Installation Contractors (RFSICs) on the points to note during the inspection, maintenance, modification or repair of fire service installations and equipment (FSI).

Notification mechanism for shutdown of FSI

FSIs are installed in buildings and premises for the protection of life and property in case of fire and other calamity. Any FSI which is defective or for any other reasons not in efficient working order may constitute a fire hazard as defined in Section 2 of the Fire Services Ordinance (Cap 95). To prevent the occurrence of fire hazards and ensure the efficient operation of FSIs in the event of fire or other calamity, it is imperative that the Director of Fire Services (the Director) be given prior/prompt notification of the shutdown or defect(s) of any FSI. In case an FSI is found to be defective or required to be shut down for the purpose of inspection, maintenance, modification or repair, the RFSIC engaged by the FSI owner should be held responsible for informing the Director of such case in a timely manner by strictly following the notification mechanism as stipulated in FSD Circular Letter No. 3/2008 (copy attached). The RFSIC should also confirm that the Director has acknowledged receipt of the notification by checking if the submitted notification form has been returned and stamped with an FSD serial number.

Minimising the impacts of FSI works

RFSICs are reminded to observe the guidelines set out in paragraph 9 of FSD Circular Letter No. 3/2008 when an FSI is expected to be shut down overnight or for more than 24 hours continuously for carrying out works. They should never shut down an FSI system hastily unless

Duty and responsibility of RFSIC

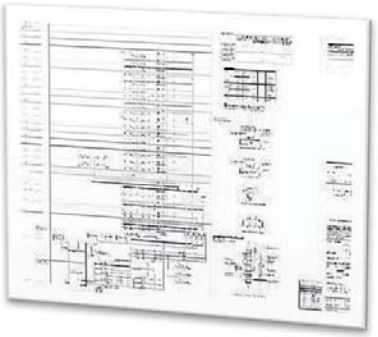
Ultimately responsible for :

- assisting FSI owners in ensuring working efficiency of FSI

- keeping abreast with and strictly adhering to the CoP and relevant procedures and requirements promulgated from time to time.

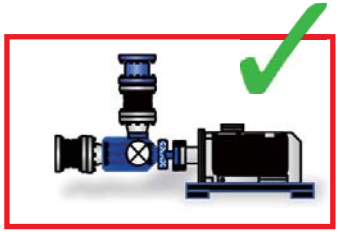
Guidelines for conducting Fire Safety Improvement Works

Works under Cap. 502 / Cap. 572 :



- Commence only with the prior approval of FSD on the FSI plans (i.e. FSI/314B, FSI/314C)

- Major components e.g. water tank and pump(s) should be installed at initial stage



Guidelines for conducting Fire Safety Improvement Works

- newly installed FSI yet to be commissioned –

  sticking blue tape with laminated notice for easy identification

- Shutdown at the conversion stage only

  - e.g. conversion of FH/HR system from dry riser

  - Annual Inspection (AI) required before conversion

- Adhere to FSD Circular letter No. 2/2018 dated 12.12.2018

FIRE SERVICES DEPARTMENT
LICENSING AND CERTIFICATION COMMAND

12 December 2018

To: Recipients of FSD Circular Letters

Dear Sir/Madam,

FSD Circular Letter No. 2/2018
Guidelines on the Formulation of Fire Safety Improvement Plans

This circular letter serves to advise on the work procedures to be adopted for shutting down fire service installations and equipment (FSIs), if necessary, in buildings/premises when carrying out fire safety improvement works in accordance with the Fire Safety (Commercial Premises) Ordinance (Cap. 502) or Fire Safety (Buildings) Ordinance (Cap. 572). The recommended work procedures are detailed at Annex I.

FSIs are installed in buildings/premises for the protection of life and property in case of fire. Any FSI which is shut down or fails to function may constitute a fire hazard as defined in section 2 of the Fire Services Ordinance (Cap. 95). FSI owners are required under regulation 8 of the Fire Service (Installations and Equipment) Regulations (Cap. 95B) to keep their FSIs in efficient working order at all times and have them inspected at least once in every 12 months by a registered fire service installation contractor (RFSIC). However, it has come to our notice that FSIs have been shut down for months in some buildings/premises where fire safety improvement works were underway. In some cases, the works had even commenced prior to the approval of the fire service installation plans (i.e., FS251/B or FS251/C, as applicable) and have lasted for an unreasonably long period of time.

In this regard, RFSICs are reminded to take heed of the hazards posed by the shutdown of FSIs in buildings/premises. They should make professional assessment of the circumstances and strictly observe the FSI shutdown guidelines set out in Appendix 9 to *The Code of Practice for Inspection, Testing and Maintenance of Installations and Equipment (2012 Revision)* and the

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Overview and Experience Sharing of Fire Service Installation Plans (FSI/314A) Submission

Engineer(NP)

Ir Martin CHAN

General Submission Flow

New Works

Initial inspection satisfying Section 21(6)(d) of the Cap.123, Buildings Ordinance

***FSI/314 + FSI/501**

Fire Service Installations Division

Building Improvement Works

Prescribed Commercial Premises / Specified Commercial Building under Cap. 502, Fire Safety (Commercial Premises) Ordinance

FSI/314B

Composite Building / Domestic Building under Cap. 572, Fire Safety (Buildings) Ordinance

FSI/314C

Building Improvement Division

A&A Works

FSD Circular Letter No.4/96

FSI/314A

New Projects Division

* *Prior approval for smoke control systems by New Projects Division is required*

Chapter 95 Fire Services Ordinance

Regulation

95B Fire Service (Installations and Equipment) Regulations

9. Issue of certificates by registered contractors

(1) Whenever a registered contractor installs, maintains, repairs or inspects any fire service installation or equipment in any premises, he shall within 14 days after completion of the work issue to the person on whose instructions the work was undertaken a certificate and forward a copy thereof to the Director.

F.S. 251

FSD Circular Letter No. 4/1996

Part VI – INSPECTIONS OF FIRE SERVICE INSTALLATIONS

4. Certification of Alteration & Addition to FSI

4.1 There have been cases where fire extinguishers originally provided are replaced by a different type. In a number of instances the replacement is unacceptable (e.g. CO_2 replaced by water type). This Department must be consulted before any alterations of this nature to existing installations is undertaken.

4.2 All installation, maintenance, repair or inspection of FSI systems which do not involve major alterations and additions to the building in excess of 50% by volume will be certified by the FSI contractor in the following manner:-

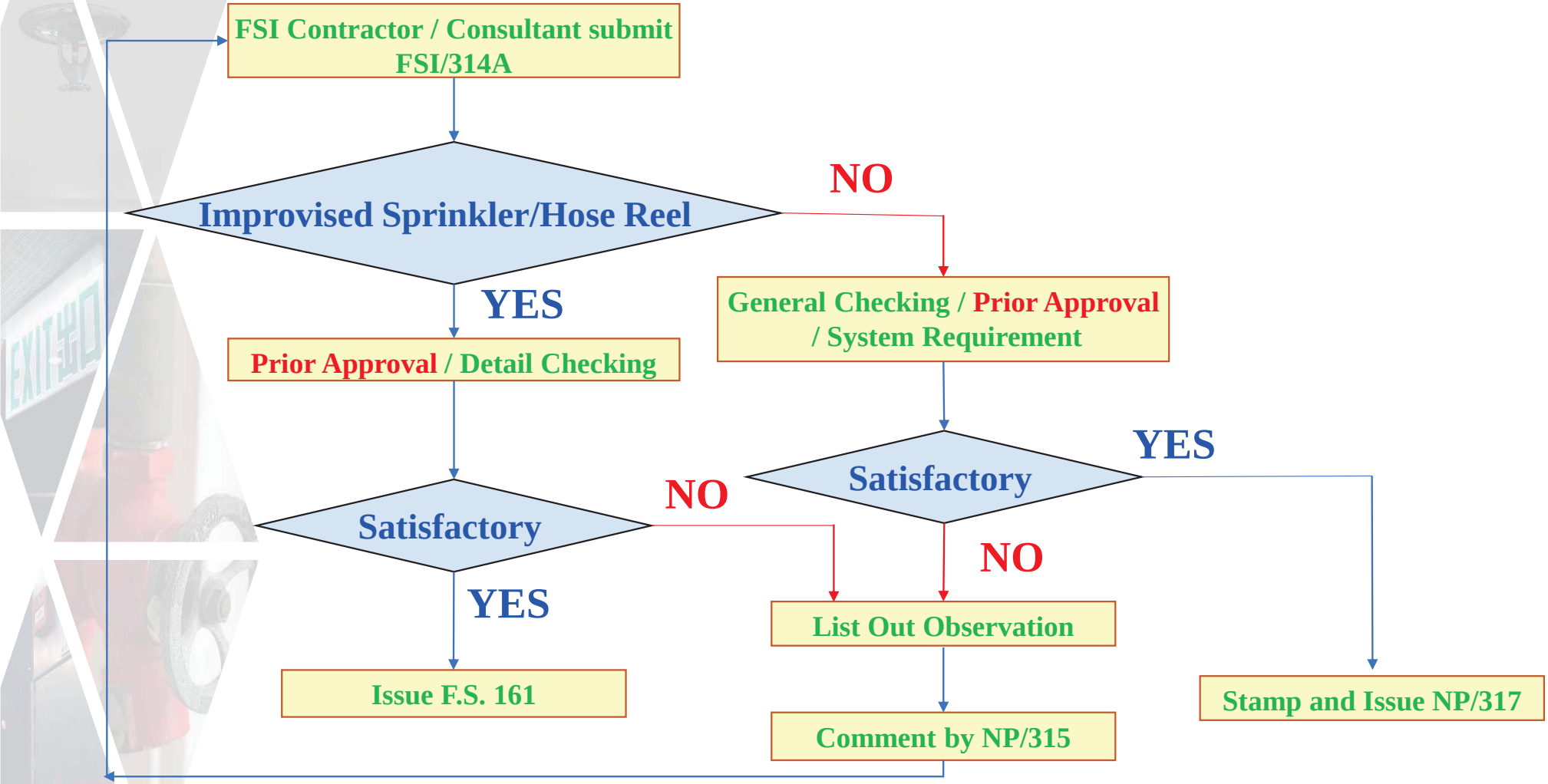
4.2.1 If the work does not involve change of FSI layout or location of the fixed equipment, a Certificate of Registered FSI (F.S. 251) to the owner with copy to the Director of Fire Services will be sufficient.

F.S. 251

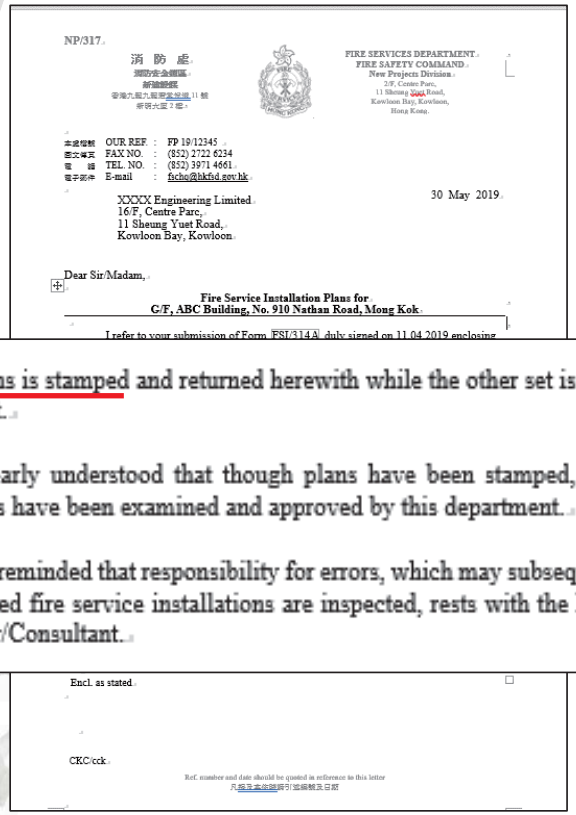
4.2.2 If the work involves change of FSI layout or location of fixed equipment, a Certificate of Compliance, i.e. FSI/314A as attached in Appendix B, together with two copies of as-built FSI layout plans should be submitted to the Director of Fire Services in addition to the copy of F.S. 251 as described above.

F.S. 251 + FSI/314A

Flow Chart for FSI/314A Processing



NP/315 & NP/317



NP/317

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FIRE SERVICES DEPARTMENT
FIRE SAFETY COMMAND
New Projects Division
2/F, Centre Parc,
11 Sheung Yuet Road,
Kowloon Bay, Kowloon,
Hong Kong.

本處檔號 OUR REF. : FP 19/12345
圖文傳真 FAX NO. : (852) 2722 6234
電 話 TEL. NO. : (852) 3971 4661
電子郵件 E-mail : fschq@hkfsd.gov.hk

30 May 2019

XXXX Engineering Limited
16/F, Centre Parc,
11 Sheung Yuet Road,
Kowloon Bay, Kowloon.

Dear Sir/Madam,

Fire Service Installation Plans for
G/F, ABC Building, No. 910 Nathan Road, Mong Kok

I refer to your submission of Form FSI/314A duly signed on 11.04.2019 enclosing

One set of plans is stamped and returned herewith while the other set is retained for use by this department.

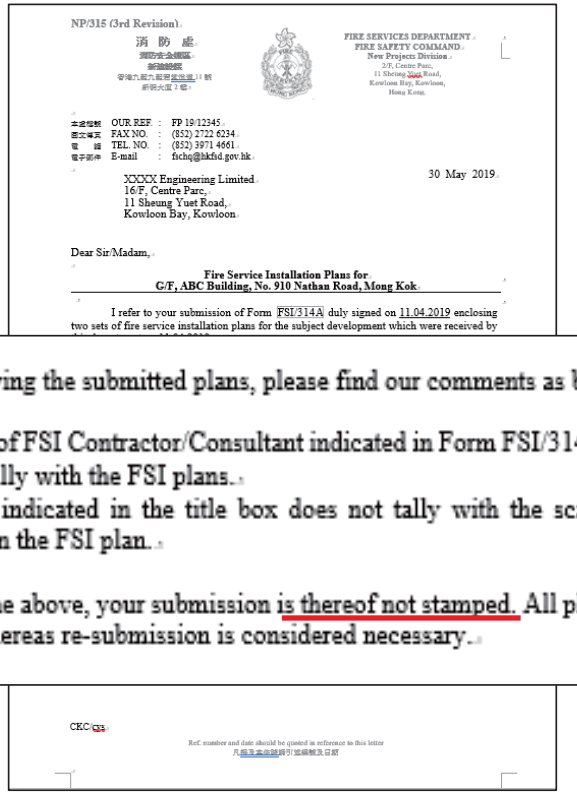
It must be clearly understood that though plans have been stamped, it does not signify that these plans have been examined and approved by this department.

Please also be reminded that responsibility for errors, which may subsequently come to light when completed fire service installations are inspected, rests with the Fire Service Installation Contractor/Consultant.

Encl. as stated.

CKC/cck

Ref. number and date should be quoted in reference to this letter
凡與本處聯絡時引述編號及日期



NP/315 (3rd Revision)

消 防 處

FIRE SERVICES DEPARTMENT
FIRE SAFETY COMMAND
New Projects Division
2/F, Centre Parc,
11 Sheung Yuet Road,
Kowloon Bay, Kowloon,
Hong Kong.

本處檔號 OUR REF. : FP 19/12345
圖文傳真 FAX NO. : (852) 2722 6234
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電子郵件 E-mail : fschq@hkfsd.gov.hk

30 May 2019

XXXX Engineering Limited
16/F, Centre Parc,
11 Sheung Yuet Road,
Kowloon Bay, Kowloon.

Dear Sir/Madam,

Fire Service Installation Plans for
G/F, ABC Building, No. 910 Nathan Road, Mong Kok

I refer to your submission of Form FSI/314A duly signed on 11.04.2019 enclosing two sets of fire service installation plans for the subject development which were received by

After reviewing the submitted plans, please find our comments as below: -

(i) The name of FSI Contractor/Consultant indicated in Form FSI/314A does not tally with the FSI plans.

(ii) The scale indicated in the title box does not tally with the scale indicated in the FSI plan.

In view of the above, your submission is thereof not stamped. All plans submitted are returned herewith whereas re-submission is considered necessary.

CKC/cck

Ref. number and date should be quoted in reference to this letter
凡與本處聯絡時引述編號及日期

NP/317

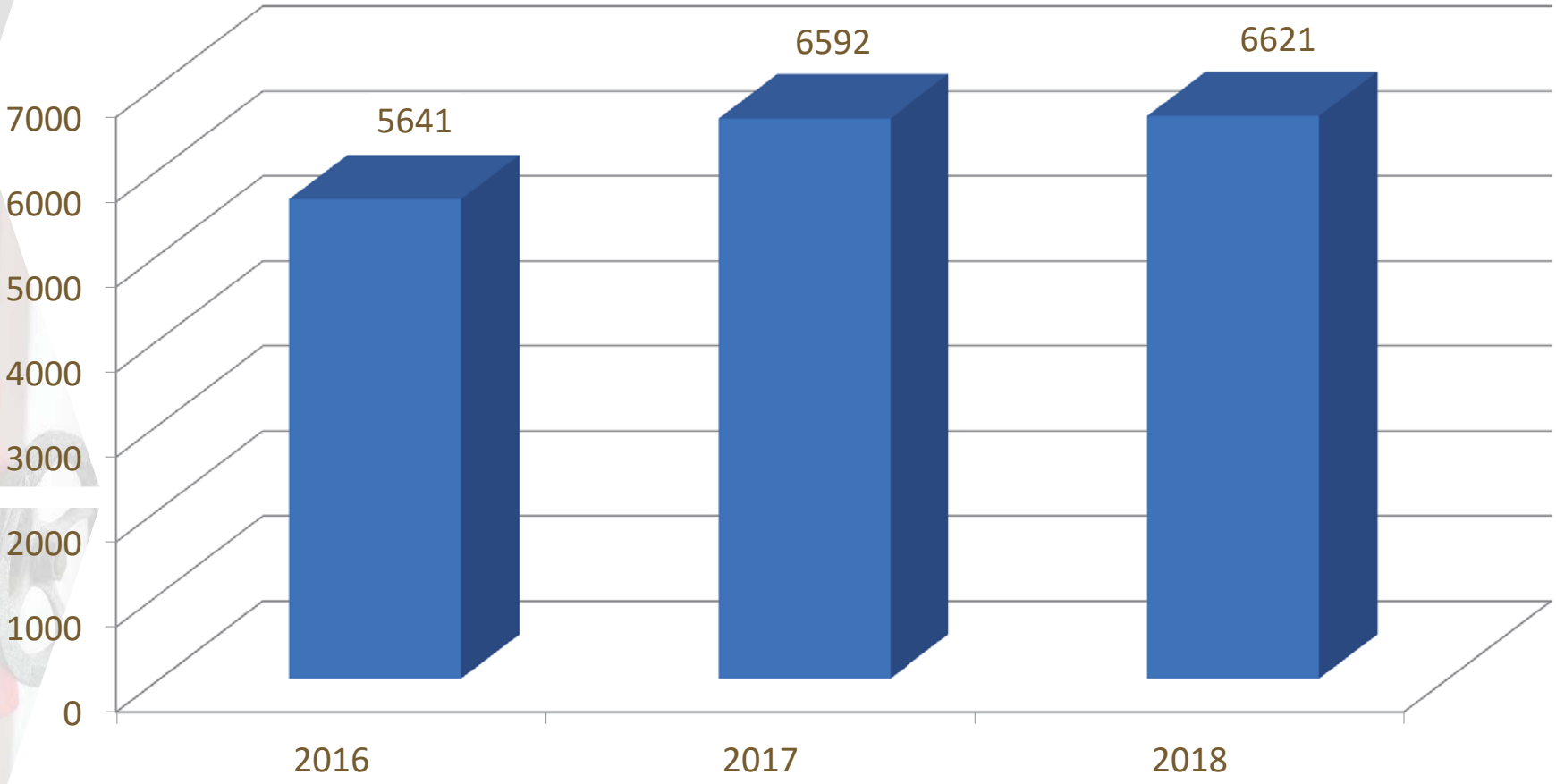
- FSI plans will be stamped
- One set of drawing to be returned to FSIC/Consultant

NP/315

- FSI plans will not be stamped and will be returned to FSIC/Consultant
- List out the observation(s)

Processing of FSI/314A Submissions

No. of FSI/314A Submission Processed



Processing of FSI/314A Submissions

	No. of FSI/314A Plans Processed	No. of NP/315 issued	Percentage
2016	5,641	610	11%
2017	6,592	2,247	34%
2018	6,621	2,999	45%

Processing of FSI/314A Plans

General Checking

- **Check Form FSI/314A**
  - Original Copy of FSI/314A (Duly Signed with Company Chop)
  - Address of the Premises
  - Nature of work

- **Check FSI Plan**
  - Scale
  - Readable & Precise
  - Company Name of FSIC / Consultant
  - Address of the Premises
  - 2 Identical Sets
  - Legends
  - Location Plan
  - Colour Pipe Sizes
  - Differentiation of A & A Works
  - Technical Aspects

Quality of Submission

Sprinkler Installation

1. High temperature rating sprinkler heads (93/141 degree C) with full justification
2. Only fast response type sprinkler heads in basement except strong room & safe deposit vaults
3. Minimum distance between sprinklers
4. Wet pipe systems unless freezing consideration

BRITISH STANDARD

BS EN 12845:2003

Fixed firefighting systems — Automatic sprinkler systems — Design, installation and maintenance

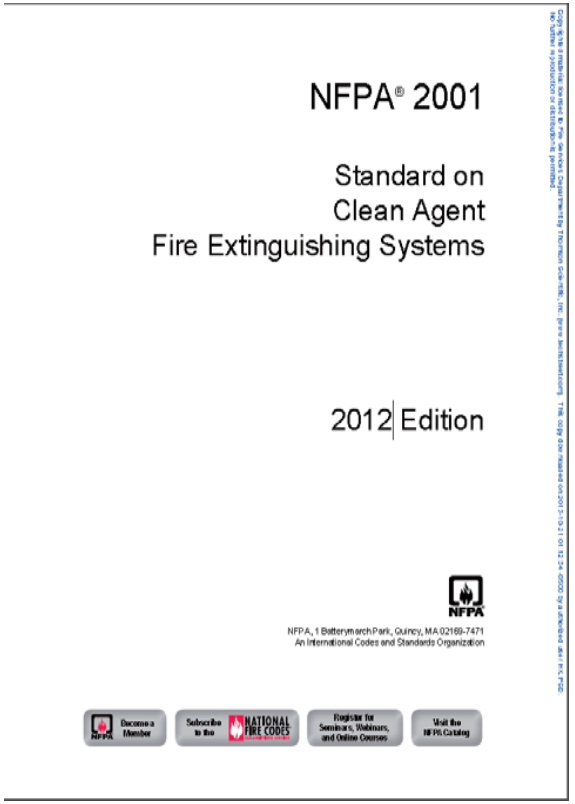
The European Standard EN 12845:2003 has the status of a British Standard

ICS 13.220.20

BSI British Standards

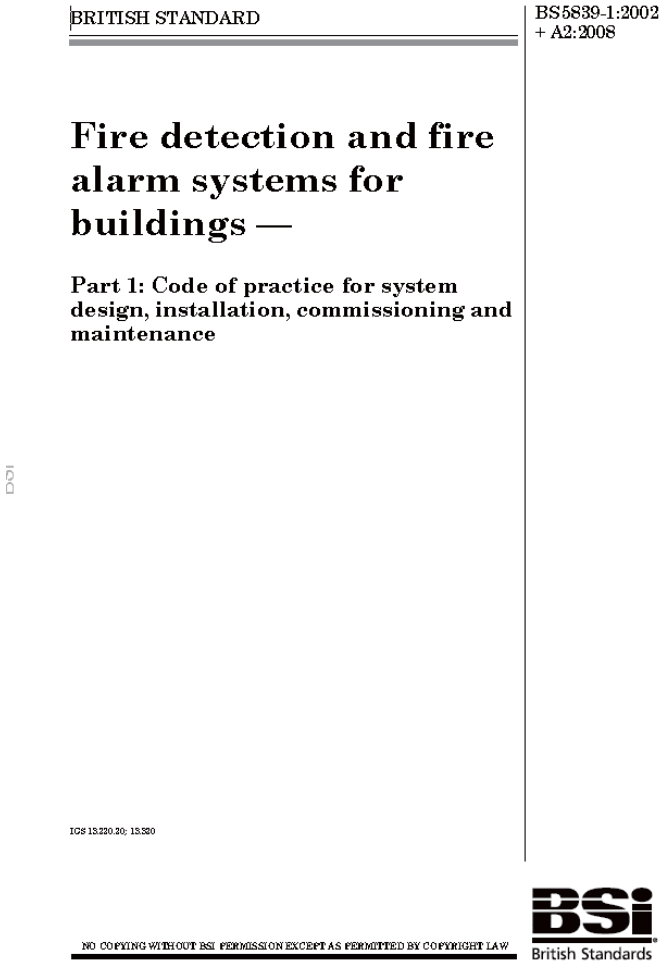
Clean Agent Extinguishing System

1. Computer calculation
2. Operation procedure of automatic mode and manual mode in the plan



Automatic Fire Detection System

1. Entire floor excluding toilets, bathrooms & staircases if involve sleeping accommodation
2. Signals to FSCC via direct link for the new AFA system.
3. Signals of new FS panel connection to the main building fire alarm panel.
4. The entire basement area except car parking areas, strong rooms and safe deposit vaults.



BRITISH STANDARD

BS5839-1:2002
+ A2:2008

Fire detection and fire alarm systems for buildings —

Part 1: Code of practice for system design, installation, commissioning and maintenance

ICS 13.220.20; 13.320

BSi British Standards

Fixed Sprayer Unit

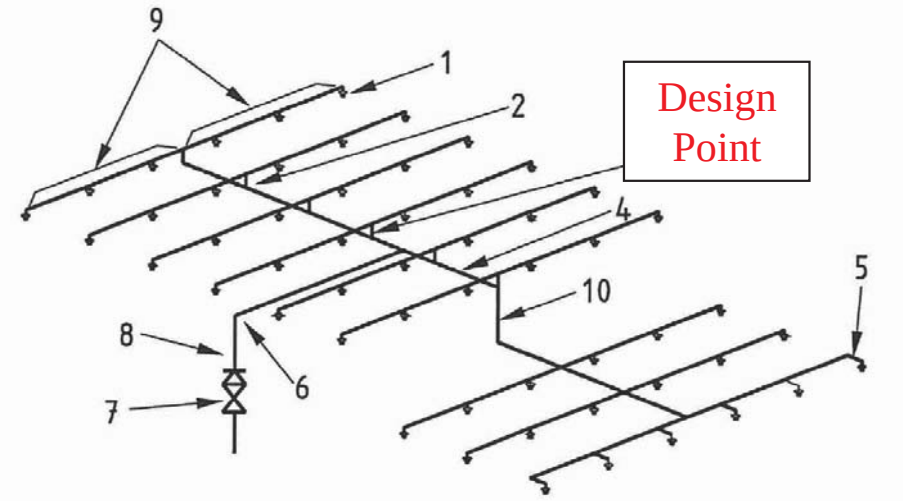
1. The room volume of the captioned location
2. The FSD approval letter of the fixed sprayer
3. The catalogue of the approved fixed sprayer

Fire Hydrant System

1. All fixed fire pumps housed in suitable enclosures (Pump Room)
2. FS pump characteristics

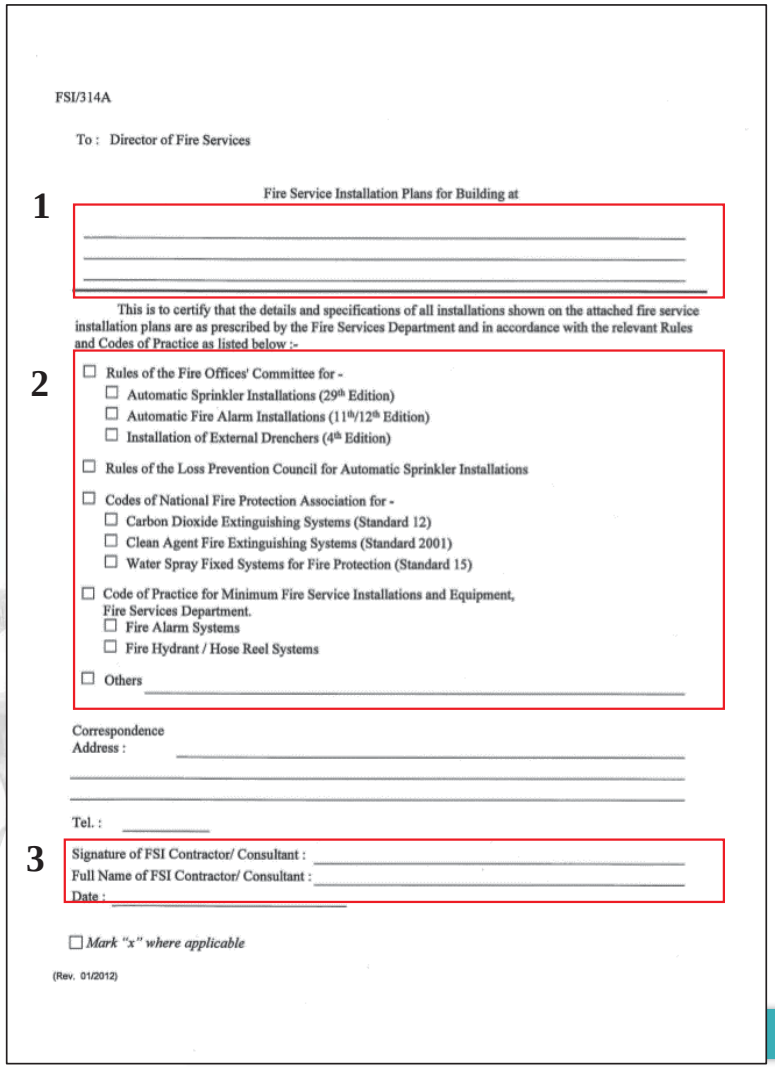
Improvised Sprinkler System

1. The correct design point marked on the layout drawing.
2. Accurate data/calculations/information in respect of the required operating pressure at the sprinkler control valve
3. Separated from other Fire Service Installation drawing.



Common Observations in FSI/314A Plans

Proper Filling of Form FSI/314A



FSI/314A

To : Director of Fire Services

1 Fire Service Installation Plans for Building at

_____

_____

_____

This is to certify that the details and specifications of all installations shown on the attached fire service installation plans are as prescribed by the Fire Services Department and in accordance with the relevant Rules and Codes of Practice as listed below :-

2

- ☐ Rules of the Fire Offices' Committee for -
  - ☐ Automatic Sprinkler Installations (29th Edition)
  - ☐ Automatic Fire Alarm Installations (11th/12th Edition)
  - ☐ Installation of External Drenchers (4th Edition)
- ☐ Rules of the Loss Prevention Council for Automatic Sprinkler Installations
- ☐ Codes of National Fire Protection Association for -
  - ☐ Carbon Dioxide Extinguishing Systems (Standard 12)
  - ☐ Clean Agent Fire Extinguishing Systems (Standard 2001)
  - ☐ Water Spray Fixed Systems for Fire Protection (Standard 15)
- ☐ Code of Practice for Minimum Fire Service Installations and Equipment, Fire Services Department.
  - ☐ Fire Alarm Systems
  - ☐ Fire Hydrant / Hose Reel Systems
- ☐ Others _____

Correspondence Address : _____

_____

_____

Tel. : _____

3

Signature of FSI Contractor/ Consultant : _____

Full Name of FSI Contractor/ Consultant : _____

Date : _____

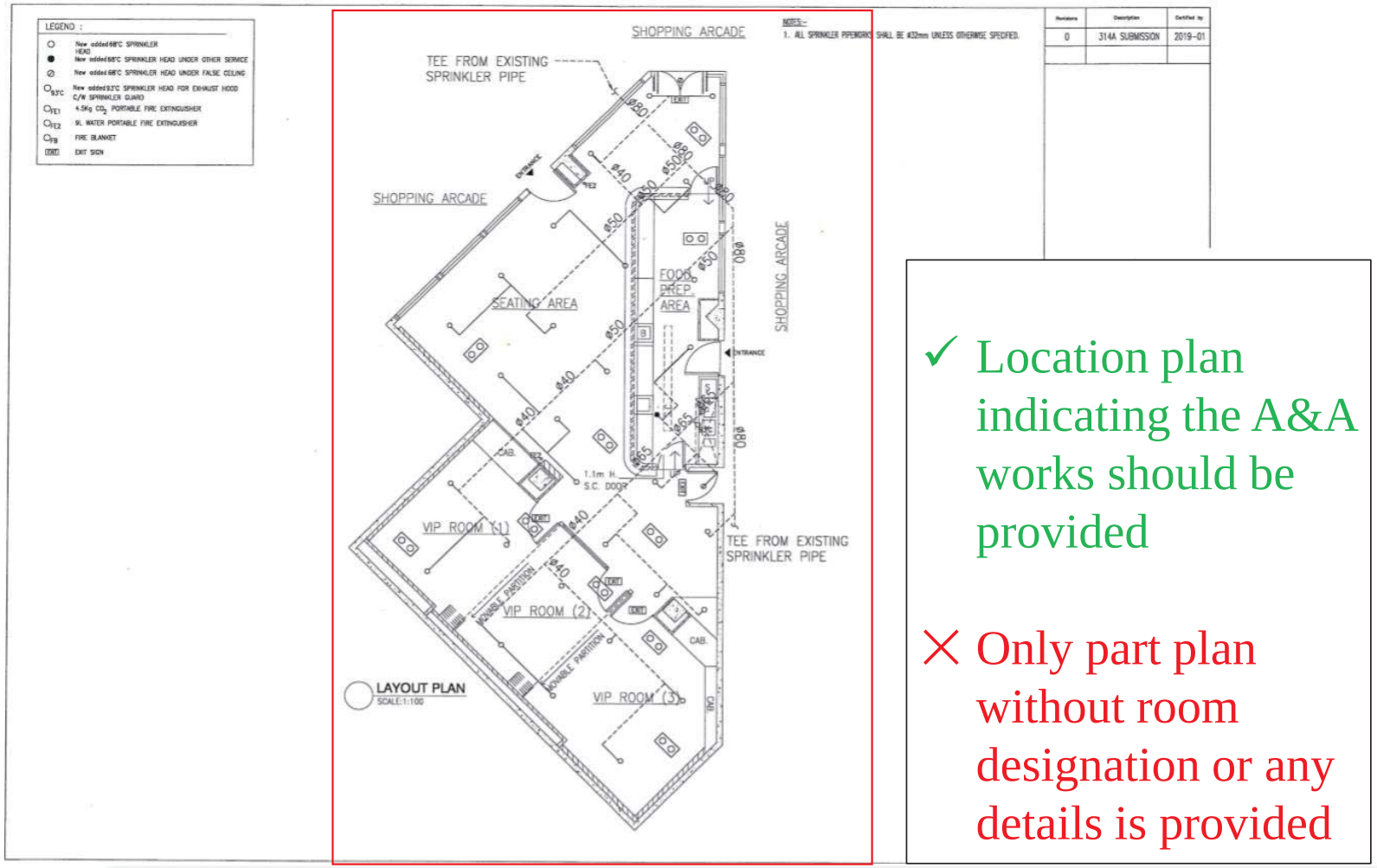
☐ *Mark "x" where applicable*

(Rev. 01/2012)

- ✓ Location of A&A works shall tally with drawings
- ✓ Type of FSI shall be clearly stated (Separate FSI/314A form shall be submitted for Improvised Sprinkler System)
- ✓ Signed by the appointed FSI Contractor / Consultant

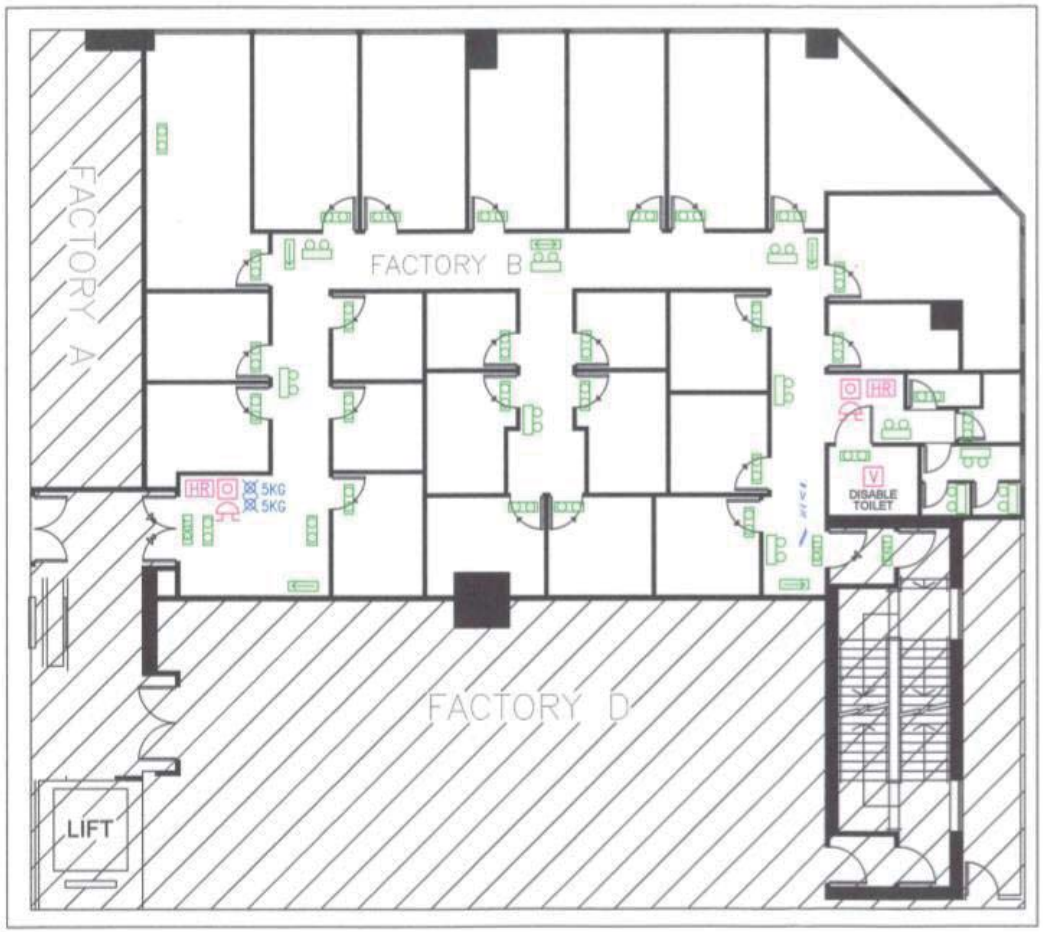
- ✗ Name of FSI Contractor / Consultant is missing
- ✗ Correspondence address is missing
- ✗ Signature Date of FSI Contractor / Consultant is earlier than the completion date of works as stated in FS251

Location Plan of Proposed A&A Works



- ✓ Location plan indicating the A&A works should be provided
- ✗ Only part plan without room designation or any details is provided

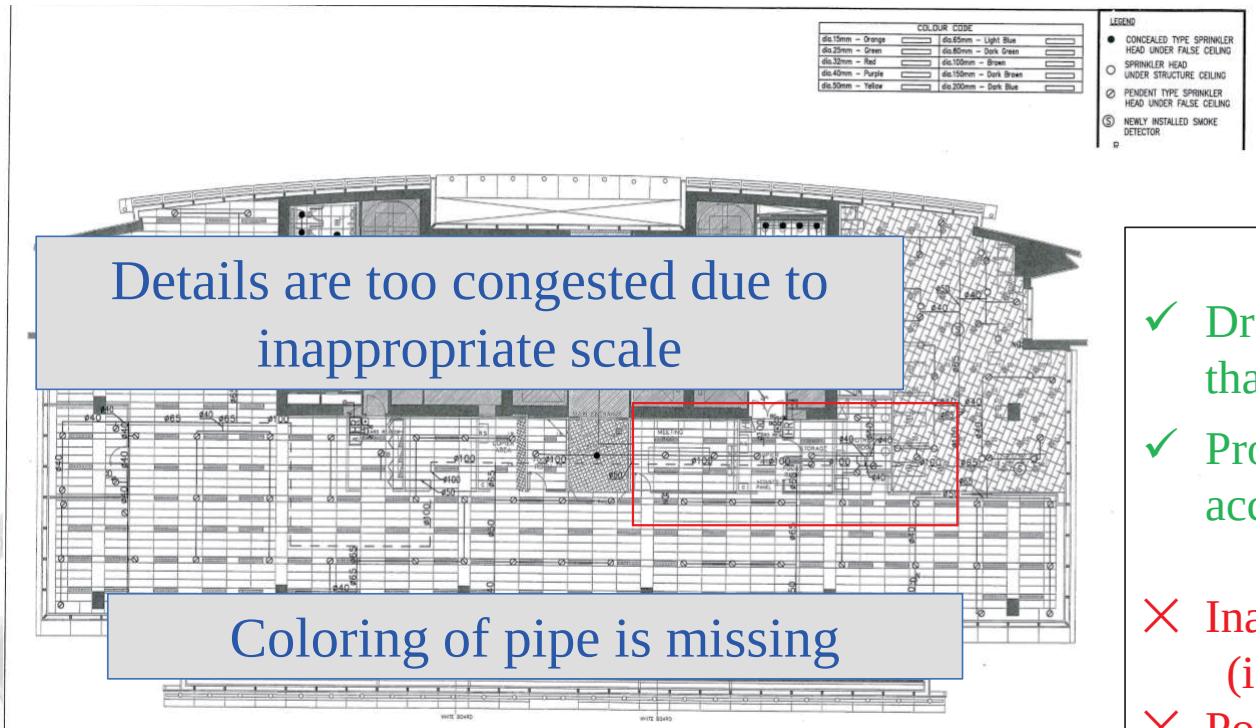
Location Plan of Proposed A&A Works



Location plan indicating the flat with A&A works

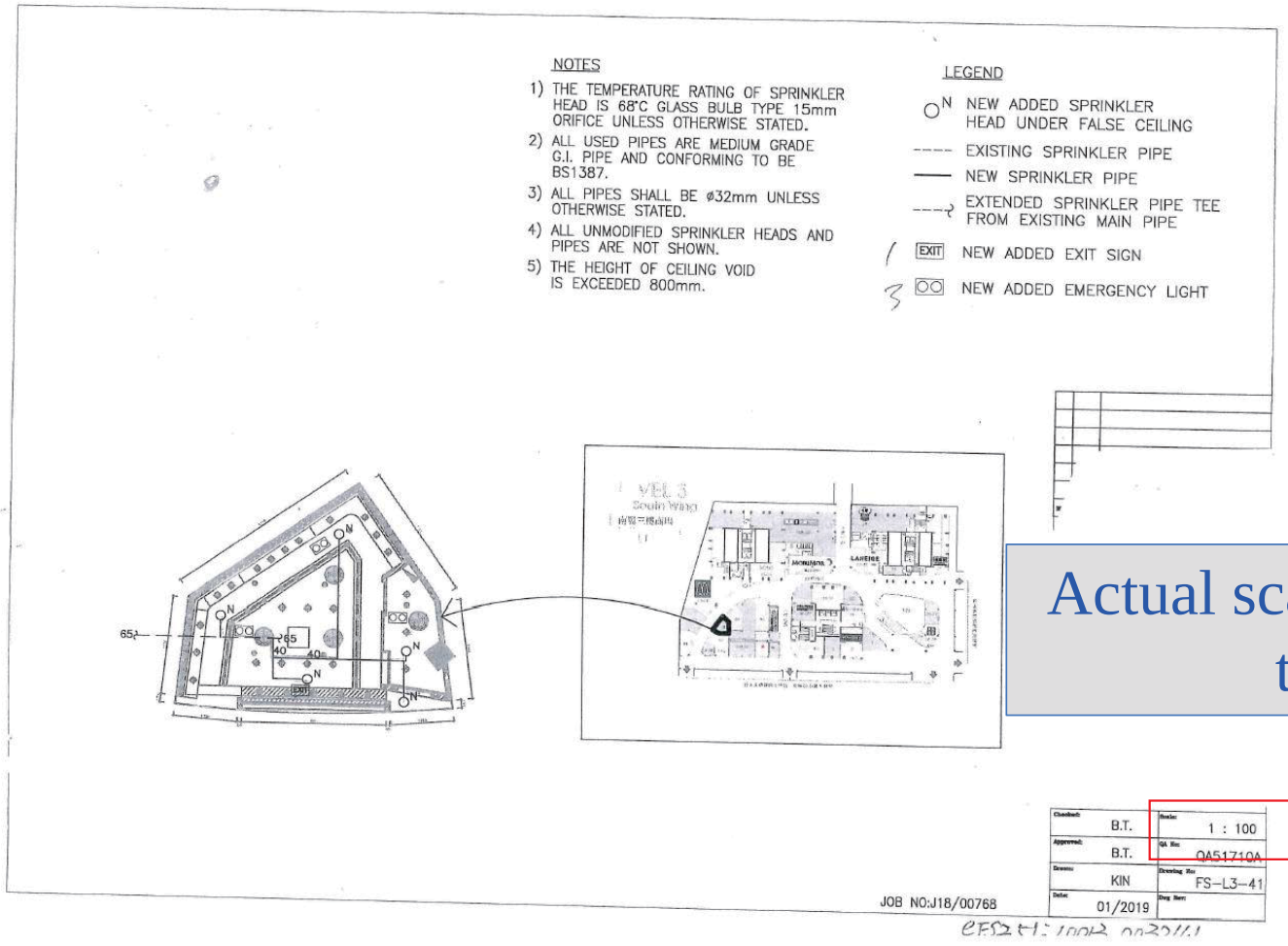
EXIT SIGN
DIRECTION SIGN
5KG 5KG CO2 FIRE EXTINGUISHER

Inappropriate Drawing Scale & Coloring of Pipe



- ✓ Drawn to ratio not less than 1:100
- ✓ Proper coloring of pipe according to pipe size
- ✗ Inappropriate scale (i.e. 1:62.5)
- ✗ Poor resolution

Inappropriate Drawing Scale & Coloring of Pipe



NOTES

1) THE TEMPERATURE RATING OF SPRINKLER HEAD IS 68°C GLASS BULB TYPE 15mm ORIFICE UNLESS OTHERWISE STATED.
2) ALL USED PIPES ARE MEDIUM GRADE G.I. PIPE AND CONFORMING TO BE BS1387.
3) ALL PIPES SHALL BE ø32mm UNLESS OTHERWISE STATED.
4) ALL UNMODIFIED SPRINKLER HEADS AND PIPES ARE NOT SHOWN.
5) THE HEIGHT OF CEILING VOID IS EXCEEDED 800mm.

LEGEND

- NEW ADDED SPRINKLER HEAD UNDER FALSE CEILING
- EXISTING SPRINKLER PIPE
- NEW SPRINKLER PIPE
- EXTENDED SPRINKLER PIPE TEE FROM EXISTING MAIN PIPE
- EXIT NEW ADDED EXIT SIGN
- NEW ADDED EMERGENCY LIGHT

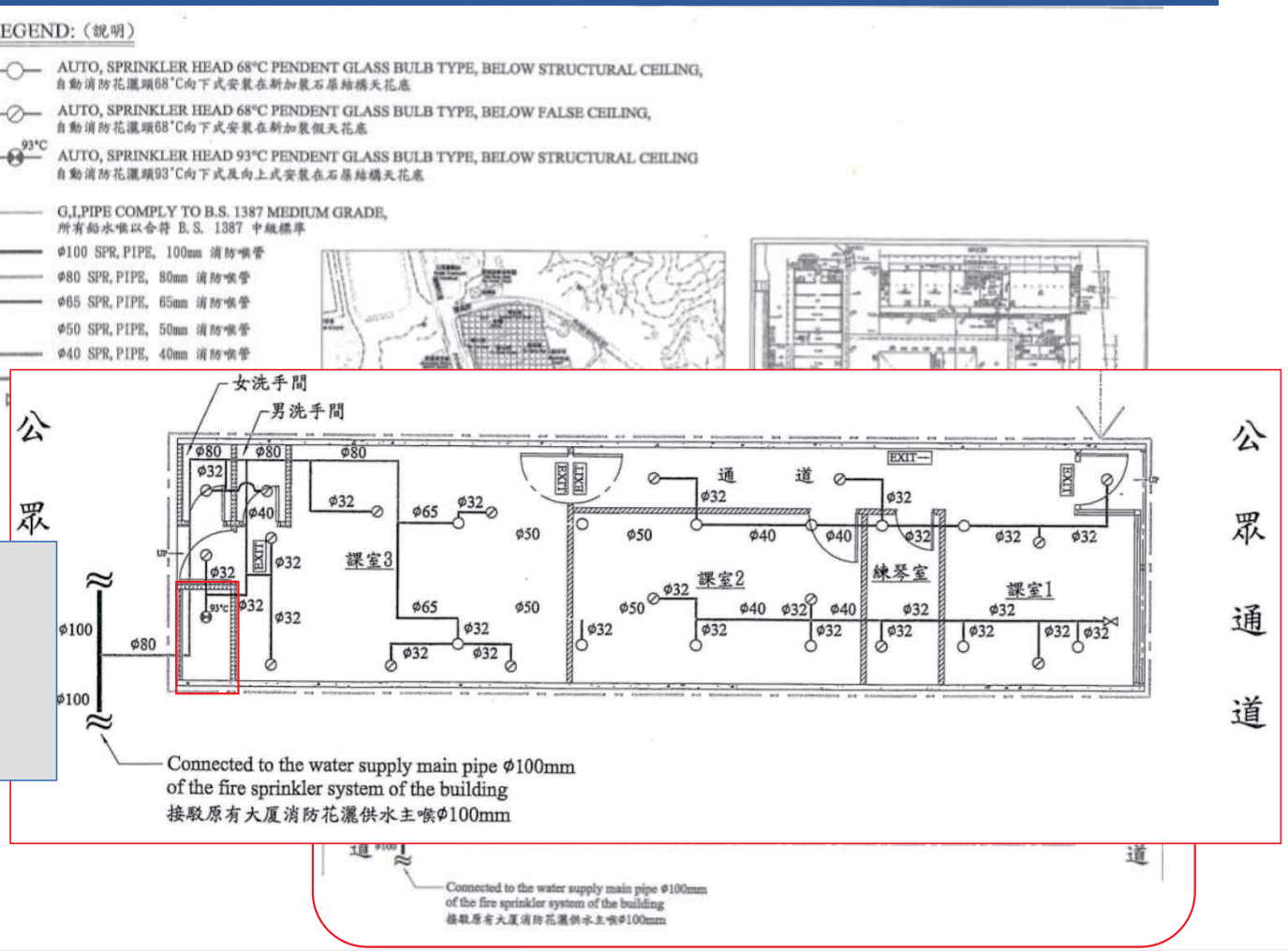
B.T.	1 : 100
B.T.	QA51710A
KIN	FS-L3-41
01/2019	

JOB NO:J18/00768

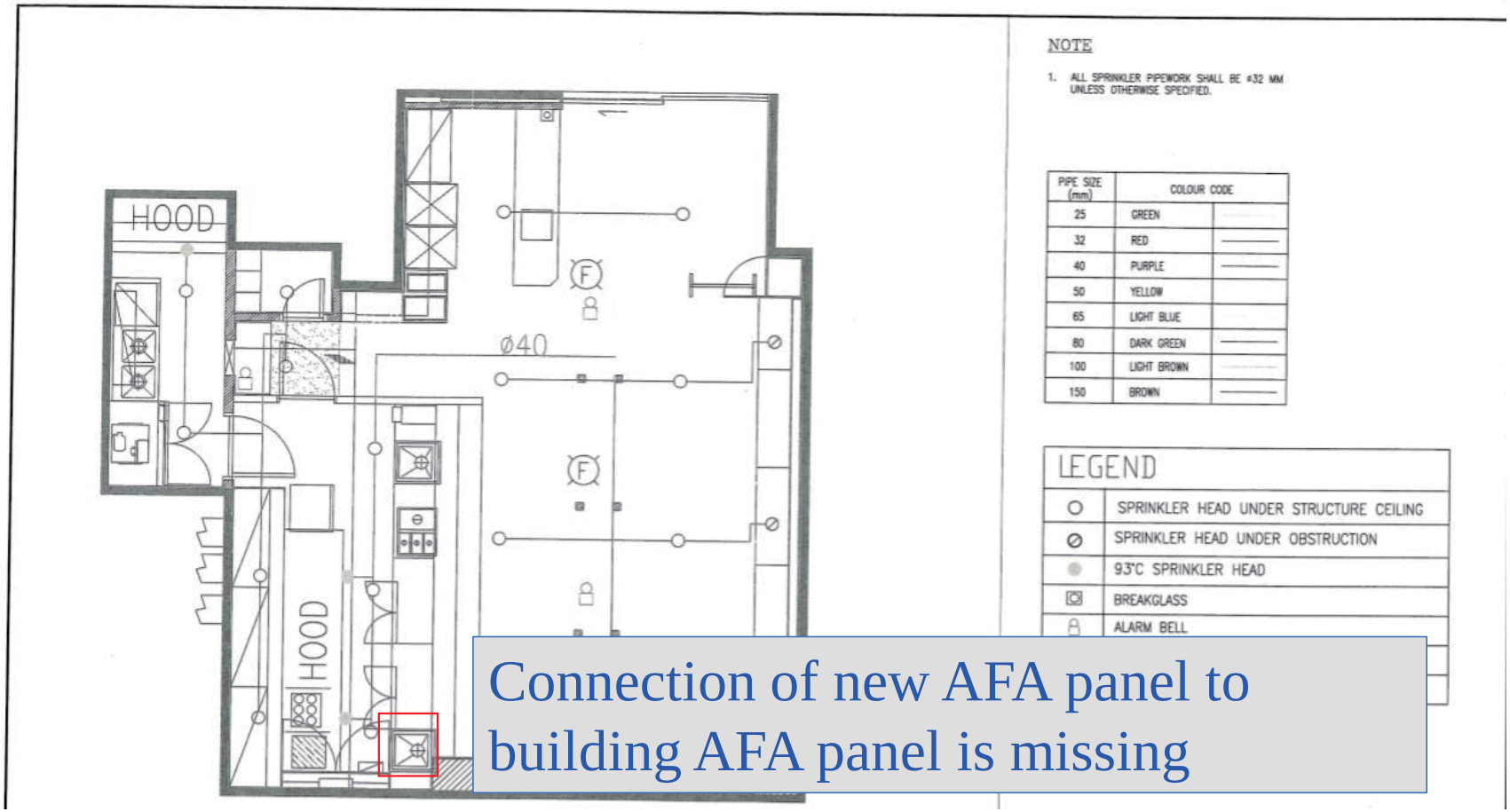
Actual scale not tally with title box

Adoption of Equipment w/o Appropriate Justification

Installation of 93°C rating sprinkler head without justification



Connection of New AFA Panel to Building AFA Panel



Connection of new AFA panel to building AFA panel is missing

Prior Approval

1. Replaced by a Different Type FSI (C.L. 4/96) (Addition/Dismantle)
   - Clean Agent such as FM200 / NOVEC1230 etc.
   - Dry pipe Sprinkler
   - Pre-action Sprinkler System
   - New AFA System
   - Improvised Sprinkler / Hose Reel System
   - Water Spray System

Prior Approval

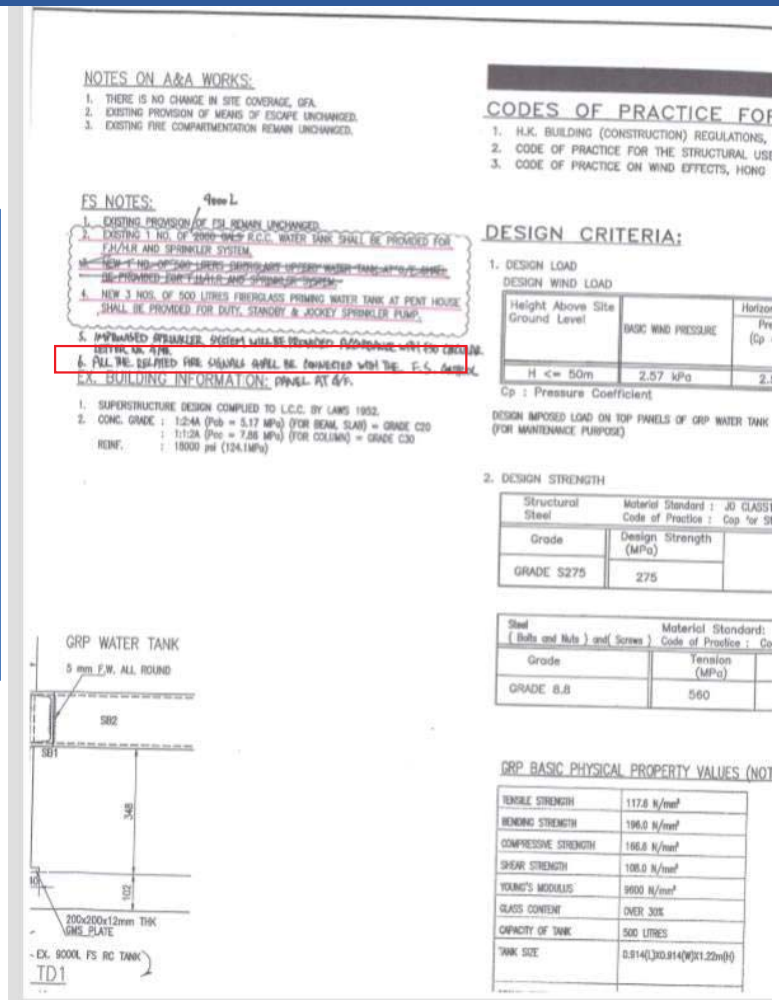
2. Authorized by other Department such as WSD or BD
   - Fire Shutter, Fire Door, Fire Curtain etc.
   - Signboard Design
   - Any A&A works have GBP Submission under Reg 33(1) of the Building (Administration) Regulations, such as change in use of the building (e.g. Revitalized Industrial Building)
   - Improvised Sprinkler / Hose Reel System

Prior Approval

3. FSI designed for Fire Services Personnel (CoP)
   - FS Inlet Location
   - Fire Hydrant
   - Street Fire Hydrant
   - FS Pump
   - Fire Control Centre Location

Letter of No Objection

Amendment of FS Note to include Improvised Sprinkler System



NOTES ON A&A WORKS:

1. THERE IS NO CHANGE IN SITE COVERAGE, GFA.
2. EXISTING PROVISION OF MEANS OF ESCAPE UNCHANGED.
3. EXISTING FIRE COMPARTMENTATION REMAIN UNCHANGED.

CODES OF PRACTICE FOR

1. H.K. BUILDING (CONSTRUCTION) REGULATIONS,
2. CODE OF PRACTICE FOR THE STRUCTURAL USE
3. CODE OF PRACTICE ON WIND EFFECTS, HONG

FS NOTES:

1. EXISTING PROVISION OF FSI REMAIN UNCHANGED.
3. EXISTING 1 NO. OF 2000 GALS R.C.C. WATER TANK SHALL BE PROVIDED FOR F.H./H.R. AND SPRINKLER SYSTEM.
4. NEW 3 NOS. OF 500 LITRES FIBERGLASS PRIMING WATER TANK AT PENT HOUSE SHALL BE PROVIDED FOR DUTY, STANDBY & JOCKEY SPRINKLER PUMP.
5. IMPROVISED SPRINKLER SYSTEM WILL BE PROVIDED ACCORDING WITH FSD CIRCULAR LETTER NO. 4/96.
6. ALL THE ISOLATED FIRE CISTERNS SHALL BE CONNECTED WITH THE F.S. SYSTEM.

EX. BUILDING INFORMATION: PANEL AT G/F.

1. SUPERSTRUCTURE DESIGN COMPLIED TO L.C.C. BY LAWS 1952.
2. CONC. GRADE : 1:2:4A (Fcb = 5.17 MPa) (FOR BEAM, SLAB) = GRADE C20
   : 1:1:2A (Fcc = 7.88 MPa) (FOR COLUMN) = GRADE C30
   REINF. : 18000 psi (124.1MPa)

DESIGN CRITERIA:

1. DESIGN LOAD

DESIGN WIND LOAD

Height Above Site Ground Level	BASIC WIND PRESSURE	Horizo... Pr... (Cp ...
H <= 50m	2.57 kPa	2.1

Cp : Pressure Coefficient

DESIGN IMPOSED LOAD ON TOP PANELS OF GRP WATER TANK (FOR MAINTENANCE PURPOSE)

2. DESIGN STRENGTH

Structural Steel	Material Standard : JIS CLASS... Code of Practice : Cap 1... St...
Grade	Design Strength (MPa)
GRADE S275	275

Steel (Bolts and Nuts) and(Screws)	Material Standard: Code of Practice : Co...
Grade	Tension (MPa)
GRADE 8.8	560

GRP WATER TANK

5 mm F.W. ALL ROUND

SB2

SB1

348

100

200x200x12mm THK GMS PLATE

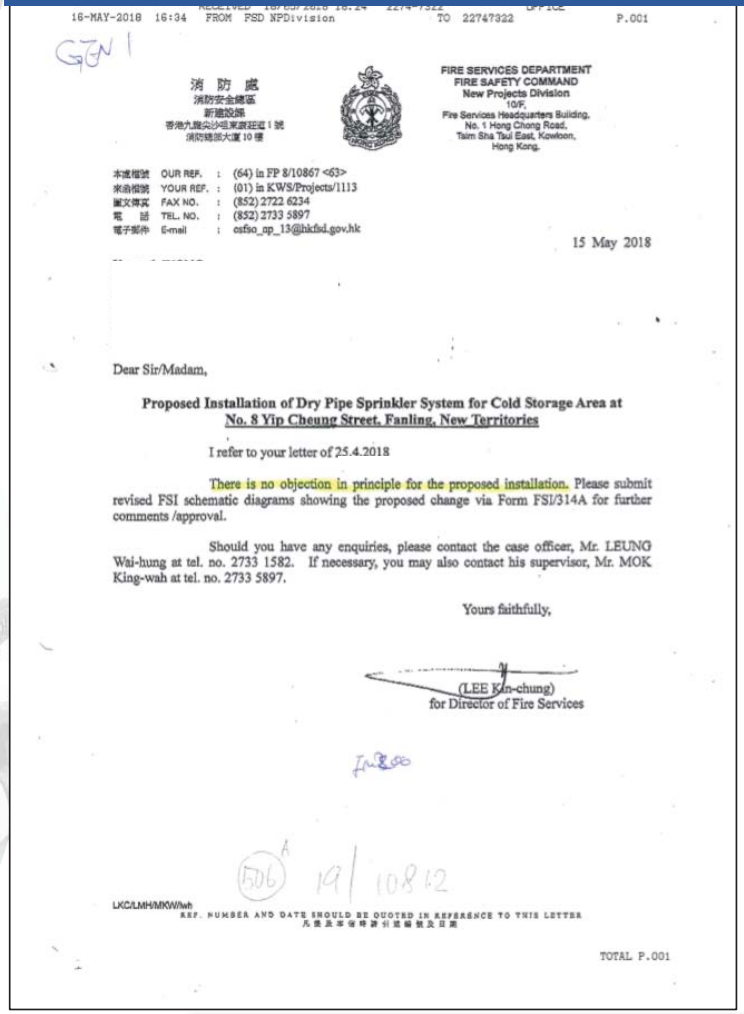
EX. 9000L FS RC TANK

TD1

GRP BASIC PHYSICAL PROPERTY VALUES (NOT...

TENSILE STRENGTH	117.6 N/mm²
BENDING STRENGTH	196.0 N/mm²
COMPRESSIVE STRENGTH	166.6 N/mm²
SHEAR STRENGTH	105.0 N/mm²
YOUNG'S MODULUS	9800 N/mm²
GLASS CONTENT	OVER 30%
CAPACITY OF TANK	500 LITRES
TANK SIZE	0.914(L)X0.914(W)X1.22m(H)

Prior Approval



16-MAY-2018 16:34 FROM FSD NPDivision TO 22747322 P.001

消 防 處
消防安全總區
新建設施
香港九龍尖沙咀東源莊道 1 號
消防總部大廈 10 樓

FIRE SERVICES DEPARTMENT
FIRE SAFETY COMMAND
New Projects Division
10/F,
Fire Services Headquarters Building,
No. 1 Hong Chong Road,
Tsim Sha Tsui East, Kowloon,
Hong Kong.

本處檔號 OUR REF. : (64) in FP 8/10867 <63>
來函檔號 YOUR REF. : (01) in KWS/Projects/1113
圖文傳真 FAX NO. : (852) 2722 6234
電 話 TEL. NO. : (852) 2733 5897
電子郵件 E-mail : csfso_np_13@hkfsd.gov.hk

15 May 2018

Dear Sir/Madam,

Proposed Installation of Dry Pipe Sprinkler System for Cold Storage Area at No. 8 Yip Cheung Street, Fanling, New Territories

I refer to your letter of 25.4.2018

There is no objection in principle for the proposed installation. Please submit revised FSI schematic diagrams showing the proposed change via Form FSI/314A for further comments /approval.

Should you have any enquiries, please contact the case officer, Mr. LEUNG Wai-hung at tel. no. 2733 1582. If necessary, you may also contact his supervisor, Mr. MOK King-wah at tel. no. 2733 5897.

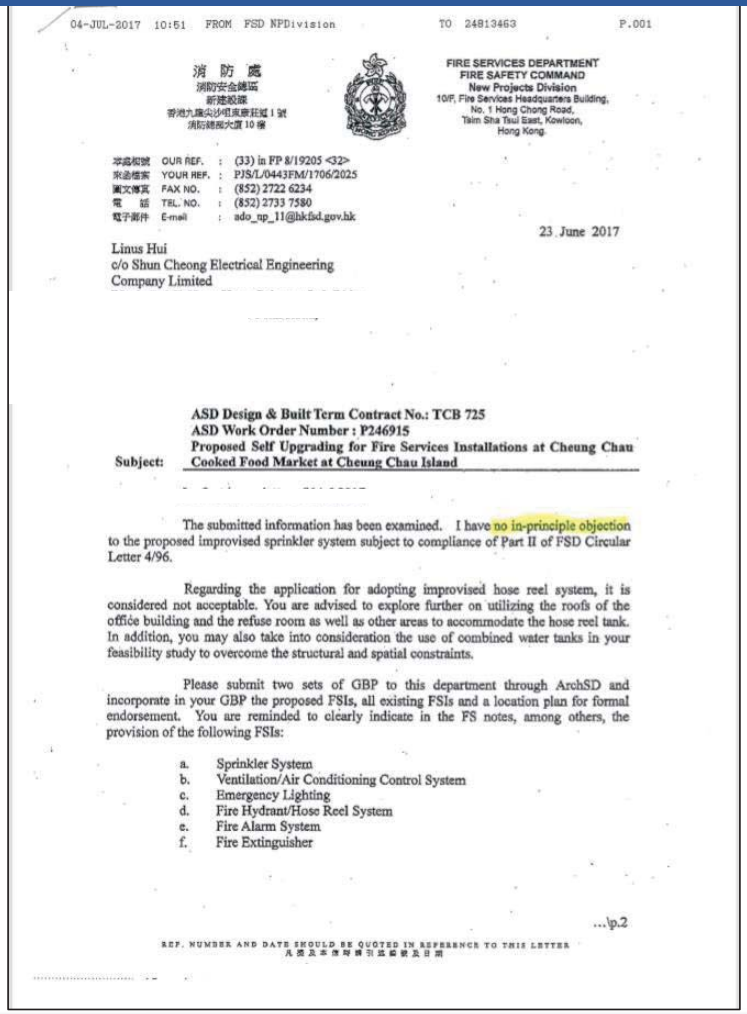
Yours faithfully,

(LEE Ka-chung)
for Director of Fire Services

LKC/LMH/MKW/fwh

REF. NUMBER AND DATE SHOULD BE QUOTED IN REFERENCE TO THIS LETTER

TOTAL P.001



04-JUL-2017 10:51 FROM FSD NPDivision TO 24813463 P.001

消 防 處
消防安全總區
新建設施
香港九龍尖沙咀東源莊道 1 號
消防總部大廈 10 樓

FIRE SERVICES DEPARTMENT
FIRE SAFETY COMMAND
New Projects Division
10/F, Fire Services Headquarters Building,
No. 1 Hong Chong Road,
Tsim Sha Tsui East, Kowloon,
Hong Kong.

本處檔號 OUR REF. : (33) in FP 8/19205 <32>
來函檔案 YOUR REF. : PJS/L/0443FM/1706/2025
圖文傳真 FAX NO. : (852) 2722 6234
電 話 TEL. NO. : (852) 2733 7580
電子郵件 E-mail : ado_np_11@hkfsd.gov.hk

23 June 2017

Linus Hui
c/o Shun Cheong Electrical Engineering
Company Limited

ASD Design & Built Term Contract No.: TCB 725
ASD Work Order Number : P246915
Subject: Proposed Self Upgrading for Fire Services Installations at Cheung Chau Cooked Food Market at Cheung Chau Island

The submitted information has been examined. I have no in-principle objection to the proposed improvised sprinkler system subject to compliance of Part II of FSD Circular Letter 4/96.

Regarding the application for adopting improvised hose reel system, it is considered not acceptable. You are advised to explore further on utilizing the roofs of the office building and the refuse room as well as other areas to accommodate the hose reel tank. In addition, you may also take into consideration the use of combined water tanks in your feasibility study to overcome the structural and spatial constraints.

Please submit two sets of GBP to this department through ArchSD and incorporate in your GBP the proposed FSIs, all existing FSIs and a location plan for formal endorsement. You are reminded to clearly indicate in the FS notes, among others, the provision of the following FSIs:

a. Sprinkler System
b. Ventilation/Air Conditioning Control System
c. Emergency Lighting
d. Fire Hydrant/Hose Reel System
e. Fire Alarm System
f. Fire Extinguisher

...\p.2

REF. NUMBER AND DATE SHOULD BE QUOTED IN REFERENCE TO THIS LETTER

Observations in VAC Submission

Observation in VAC Submission

- Incorrect demarcation of fire compartments
- Incorrect exemption of V/AC systems for mechanical ventilating systems
- Failure in identification of method of override control and actuating devices
- Failure in provision or indication of manual override switch

NP/112

Points to Note for Submission
of Form FSI/314 for Ventilation / Air Conditioning Control System

To facilitate the trade in proper installation of Ventilation / Air Conditioning (V/AC) control system, the relevant specification has been detailed in Section 5.27 of the current Code of Practice for Minimum Fire Service Installations and Equipment (The Code), and the specific applications are promulgated vide FSD Circular Letter No. 1/2019.

This synopsis aims to highlight the common irregularities and the recommended documentations in the submission of Form FSI/314 for V/AC control system with a view to enhancing the quality of submission and expediting the vetting by this department :-

(1) Common Irregularities

- Incorrect demarcation of fire compartments
  Demarcation of fire compartments is not clearly indicated or inconsistent with the approved GBP, which leads to omission of mechanical ventilating systems or causing the system fails to trip correctly as required under Part V Section 5.27 of The Code.
- Incorrect exemption of V/AC systems for mechanical ventilating systems
  V/AC systems which do not fulfill the exemption criteria as required under Part V Section 5.27 of the Code are included in the submission and lead to incorrect exemption of mechanical ventilating systems.
- Failure in identification of method of override control and actuating devices
  The method of override control and associated actuating devices of V/AC systems for mechanical ventilating systems as required under Part V Section 5.27 of the Code are unable to identify.
- Failure in provision or indication of manual override switch
  Manual override switch of V/AC systems for mechanical ventilating systems as required under Part V Section 5.27 of the Code is not indicated and provided at the central fire control panel.

NP/112 (Rev. 4/19)

(2) Recommended Documentations

In order to facilitate a comprehensive review and vetting, the following supplementary documents should be submitted together with completed form FSI/314 under the guidelines stipulated in FSD Circular Letter No. 4/1996 :-

- Schematic Diagram(s) of mechanical ventilating systems with highlights of serving areas, serving fire compartments, locations of actuating devices of V/AC systems and manual override switch, etc.
- Layout Plan(s) of mechanical ventilating systems with highlights of serving areas, serving fire compartments, locations of actuating devices of V/AC systems and manual override switch, etc.
- Approved General Building Plan(s) with highlights of fire services notes and fire compartments.
- Equipment Schedule(s) of mechanical ventilating systems listing serving areas, serving fire compartments, methods of override control and associated actuating devices of V/AC systems, exempted V/AC systems and its exemption criteria, etc.

Should there be enquiry, please contact the New Projects Division of this Department at 3971 4661.

Be the smart regulator

Efficient Design of Staircase Pressurization System

Engineer(FSI)3

Ir Dr. YIN Rumin

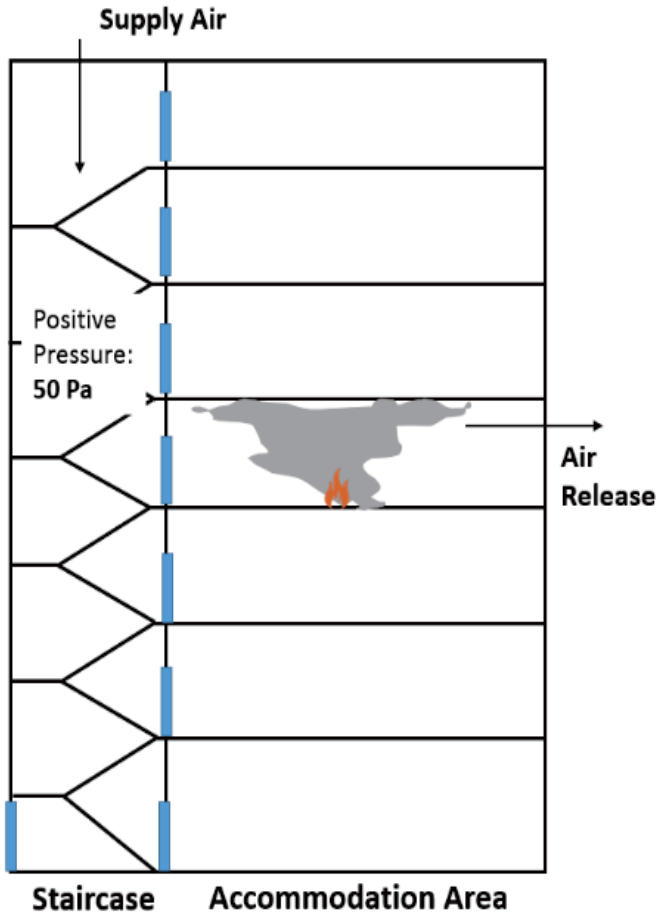
Regulations of Staircase Pressurization System

- **BS-5588 Part 4 :** Code of Practice for Smoke Control using Pressure Differentials
- **FSD Circular Letter No.2/2006**
- Two main types of SPS have been adopted locally:-

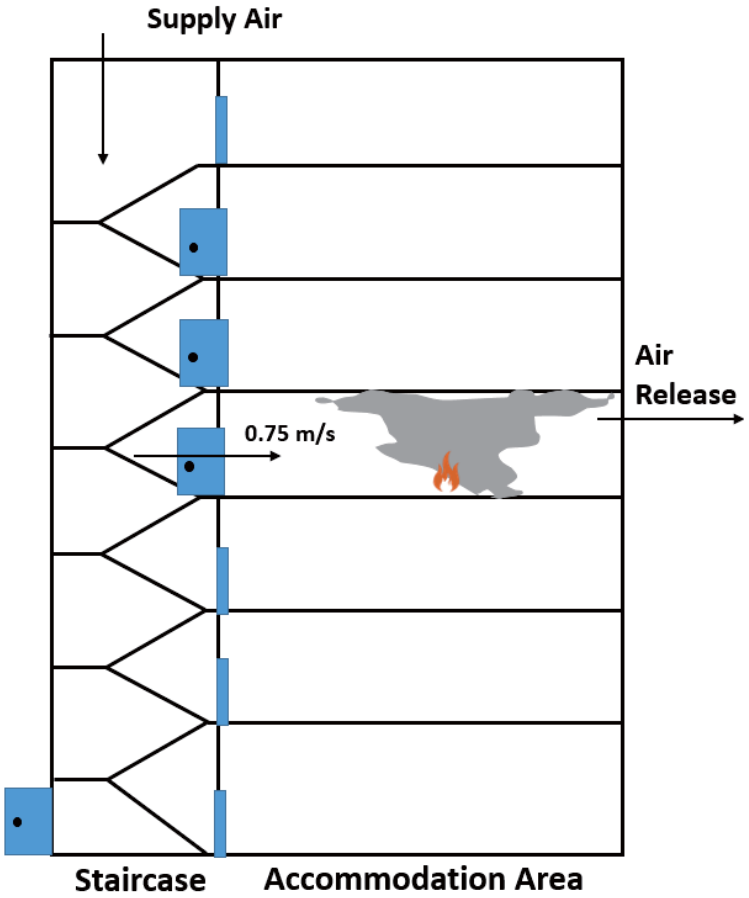
Type of System	Area of Use
Class A	Protection of escape (MoE)
Class B	Protection of firefighting shafts (MoA)

Class A – Protection of Escape

Close Door Scenario

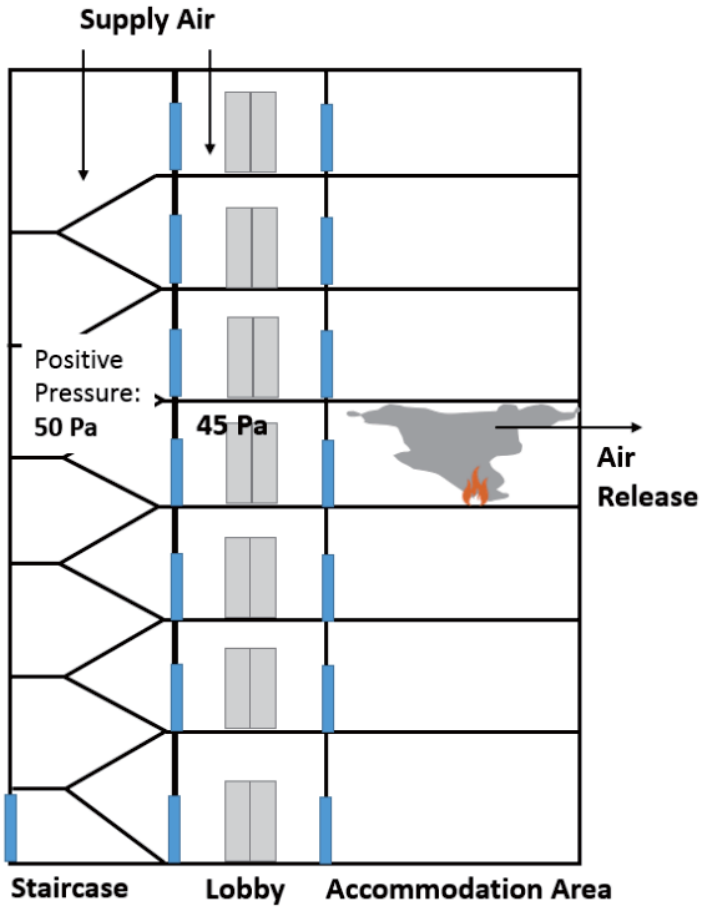


Open Door Scenario

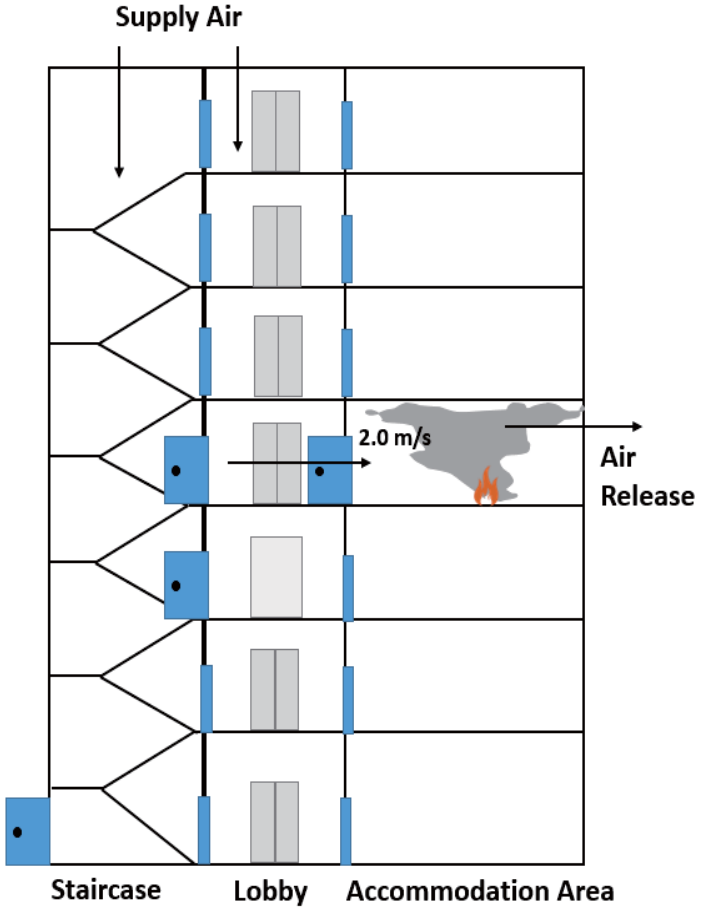


Class B – Protection of Firefighting shafts

Close Door Scenario

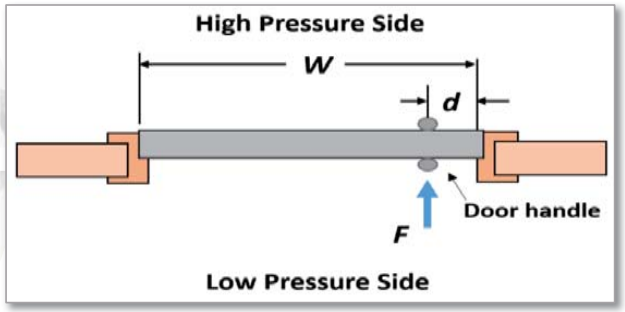


Open Door Scenario



Major Acceptance Criteria for SPS

- Minimum Pressure Differential, e.g. **Staircase at 50 Pa** and **Fireman's lift lobby at 45 Pa** to accommodation (for Class B)
- Minimum velocity at exit door, **Class A : 0.75 m/s** or **Class B : 2.0 m/s**
- Maximum allowable door opening force limited to **100 N**
- System resilience within **5 seconds** after open or close doors



Provisional Requirements for Building with SPS

- According to FSD CoP (2012), the following type of premises may require SPS :-

  - **Basement with total usable floor area exceed 230m²**
  - Commercial buildings (high rise)
  - Container terminal yards and freight stations
  - Hotels
  - Industrial/Godown buildings (high rise)
  - Institutional buildings (high rise)

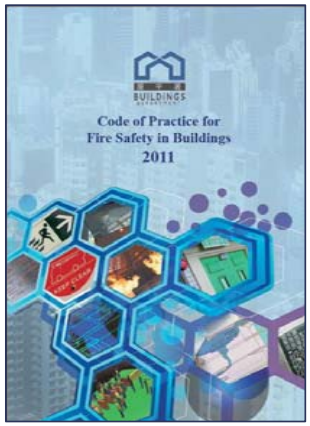
Provisional Requirements for Building with SPS

- Alternatives to SPS :
- Natural venting of staircase; or
- Open air access routes (basement only); or
- Openable windows (exceed 6.25% of the floor area)

1.13 NO STAIRCASE PRESSURIZATION SYSTEM WILL BE PROVIDED IN THE BUILDING. NATURAL VENTING STAIRCASE (ST-01 & ST-02) TO BE PROVIDED IN BUILDING IN ACCORDANCE WITH B.S. 5588:PART 5:1991.

Provisional Requirements for Building with SPS

- According to Building Fire Safety Code, SPS may be considered as one of **compensatory provisions** in case of :-
  - non-provision or deficiency of **emergency vehicular access (EVA)** due to low fire risk or constraints of topographical features [*Clause D26.1*]
  - non-provisional of **protected lobby/ventilated staircase** in Means of Escape [*Clause B10.4*]



Trends of Buildings with SPS in Hong Kong

High-rise Commercial Building
Basement greater than 230 m^2

Residential Building
Institutional Building
Industry Building
High-rise Commercial Building
Basement greater than 230 m^2

Holistic Design Cycle of Staircase Pressurization System

- Type of Premises
- Architectural Features
- Fire Safety Objectives

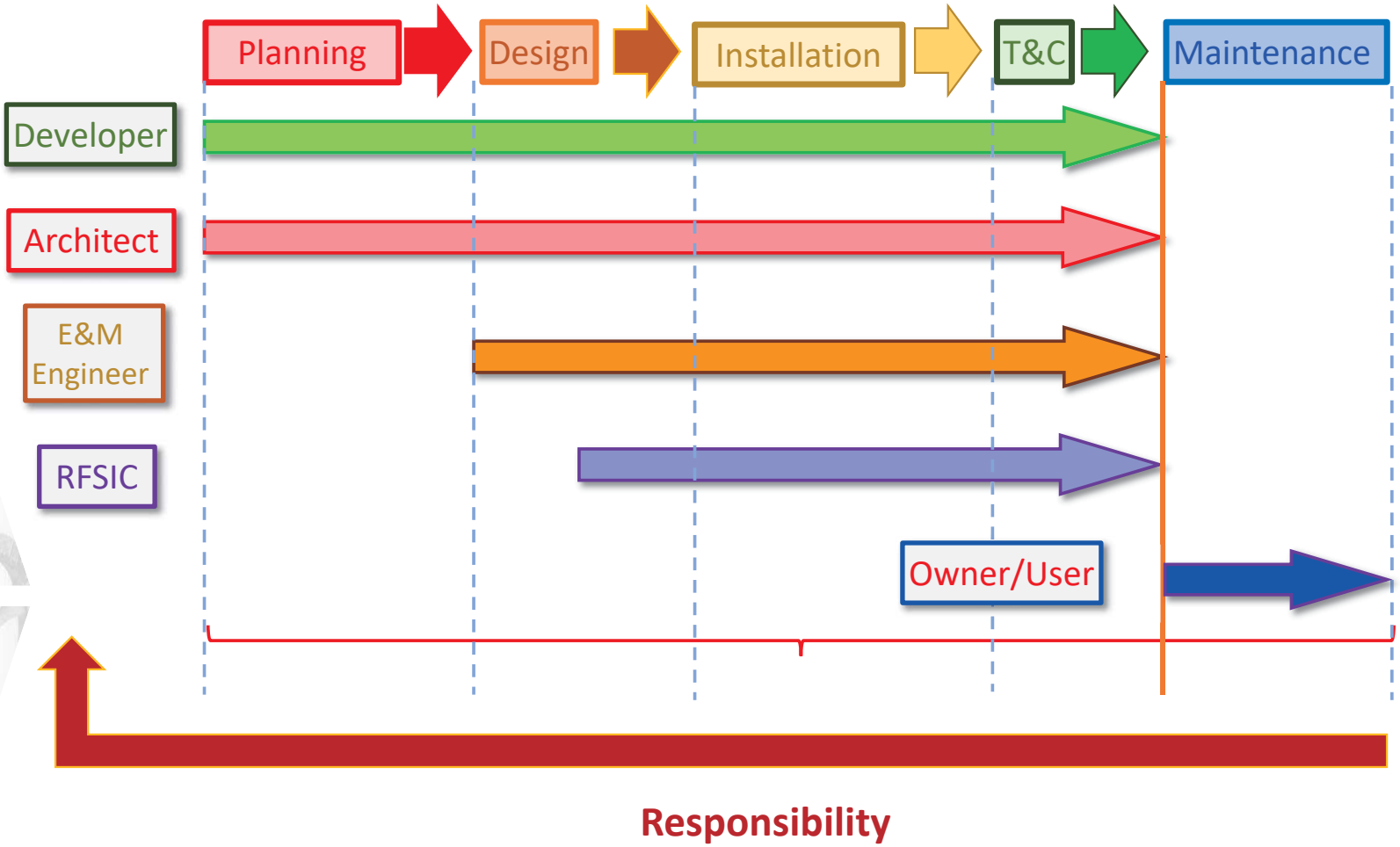
- Type of SPS chosen
- Pressurized areas
- Calculation

- Periodic Actuation
- Annually full test

- Workmanship: structure air-tightness, ductwork, smoke-stop-door
- Coordination with other FSIs

- Time
- Acceptance criteria
- Mutual effect to other systems

Responsibilities of Different Discipline in the Design of SPS



Hints on efficient SPS design

1. Think as an **End-user** in planning stage

Necessity vs Alternative Solutions

- Provide natural venting of staircase, or
- Sufficient openable windows area, or
- Protect lobby for residential building

Maintenance & Reliability

- Simple system
- Easy access through public area
- No nuisance to user in case of maintenance

Hints on efficient SPS design

2. Early coordination between Architect and Designer of SPS

✓ **Architect plays an important role in the efficient SPS design**

Air-intake	• drawing fresh air from outside without contamination of smoke
Supply fan and ductwork	• Siting & dedicated fans rooms and construction of ductwork
Floor layout	• Pressurized space, Fireman's lift and Air Release, etc.

Air Intake

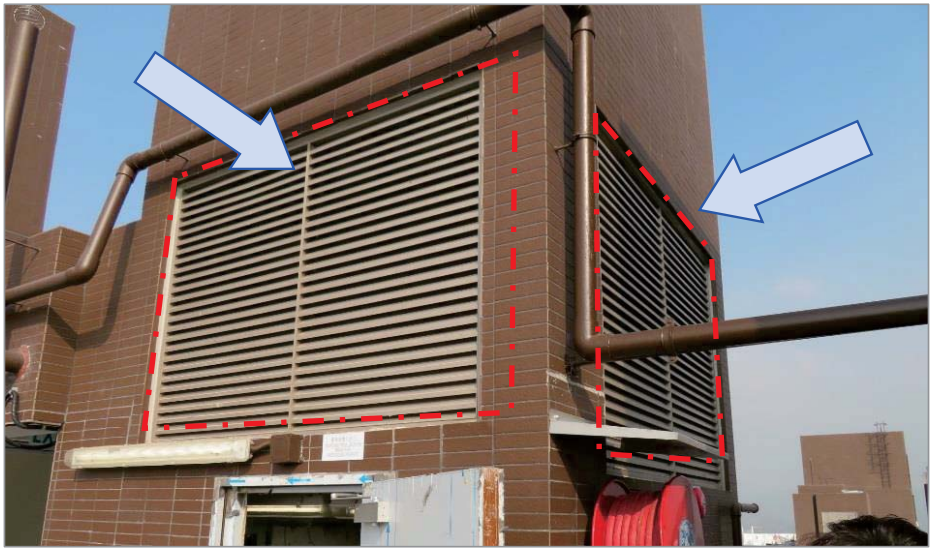
Fan Rooms

Ductwork

Hints on efficient SPS design

2. Early coordination between Architect & Designer of SPS

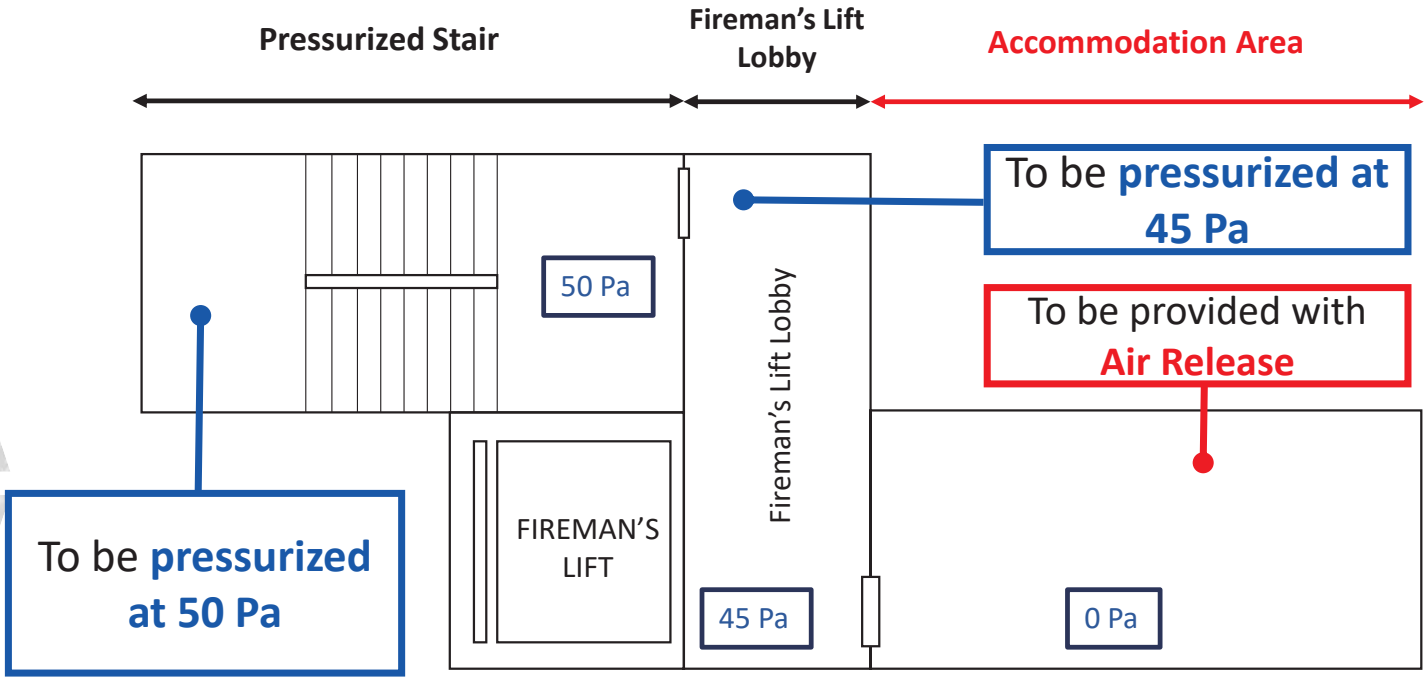
- Where air-intake are positioned above ground level, **TWO air intakes**, spaced apart and facing different directions, shall be provided



Hints on efficient SPS design

2. Early coordination between Architect & Designer of SPS

- Layout plan dominate the complexity of SPS system

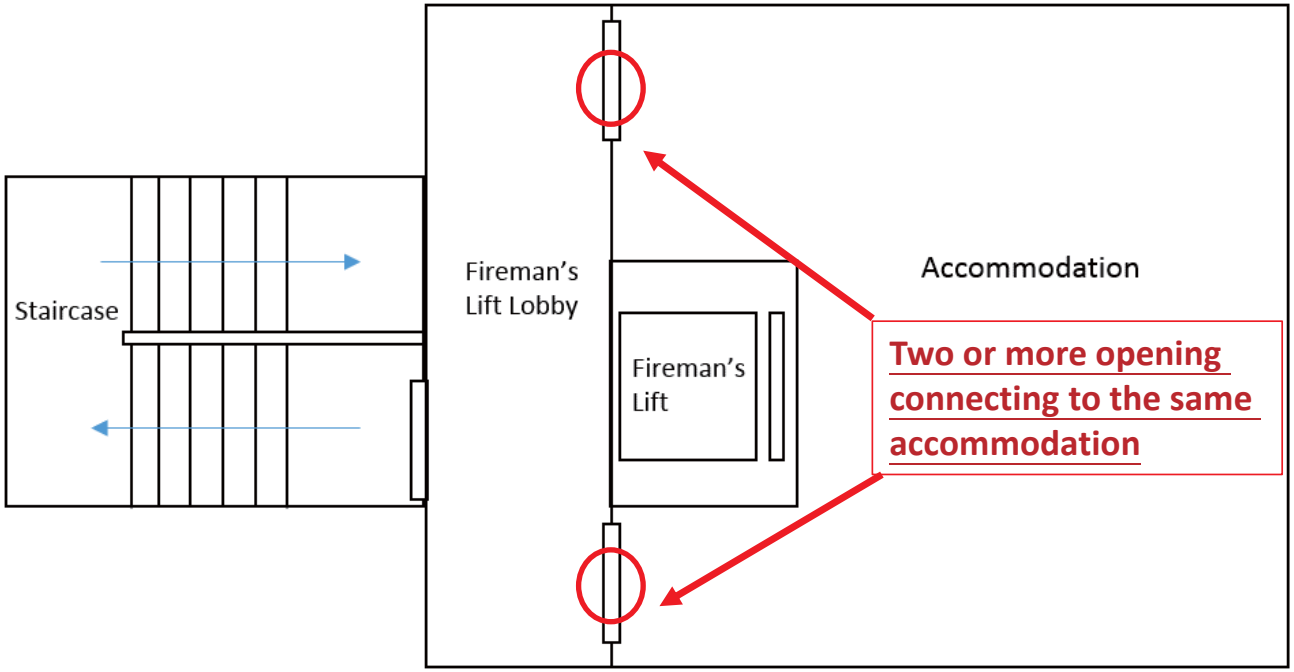


Typical Class B System Configuration

Hints on efficient SPS design

2. Early coordination between Architect & Designer of SPS

- Layout plan dominate the complexity of SPS system

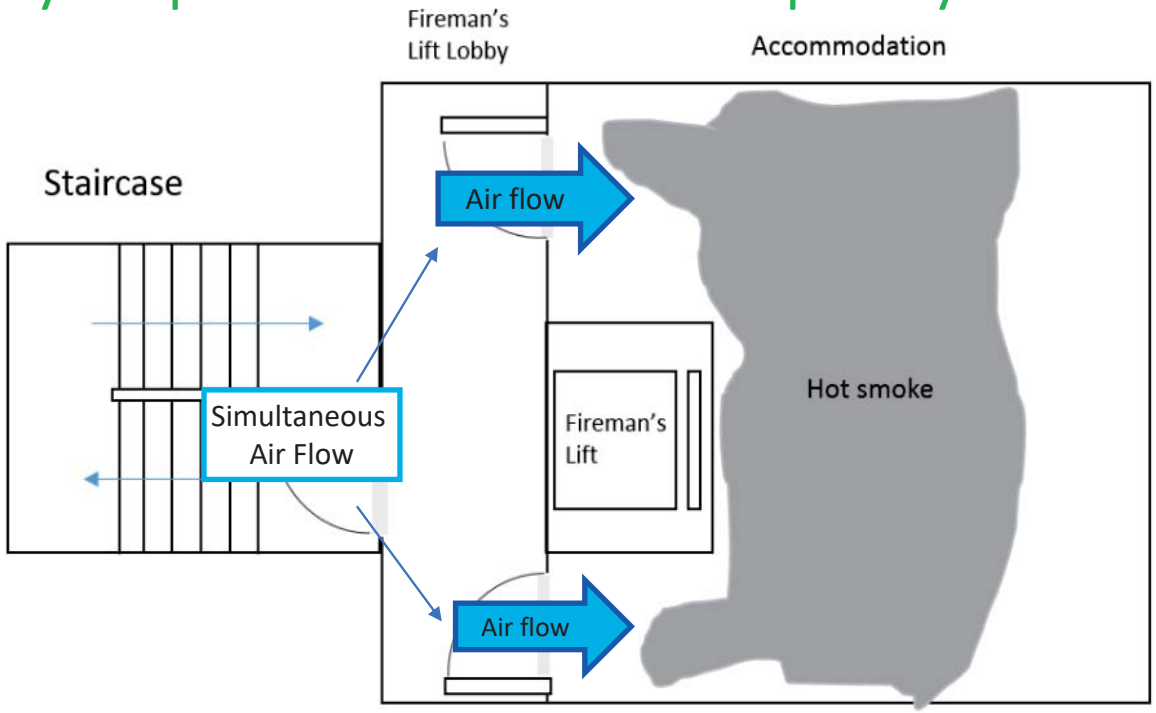


Non-typical Floor Layout with Class B design

Hints on efficient SPS design

2. Early coordination between Architect, Designer of SPS

- Layout plan dominate the complexity of SPS system

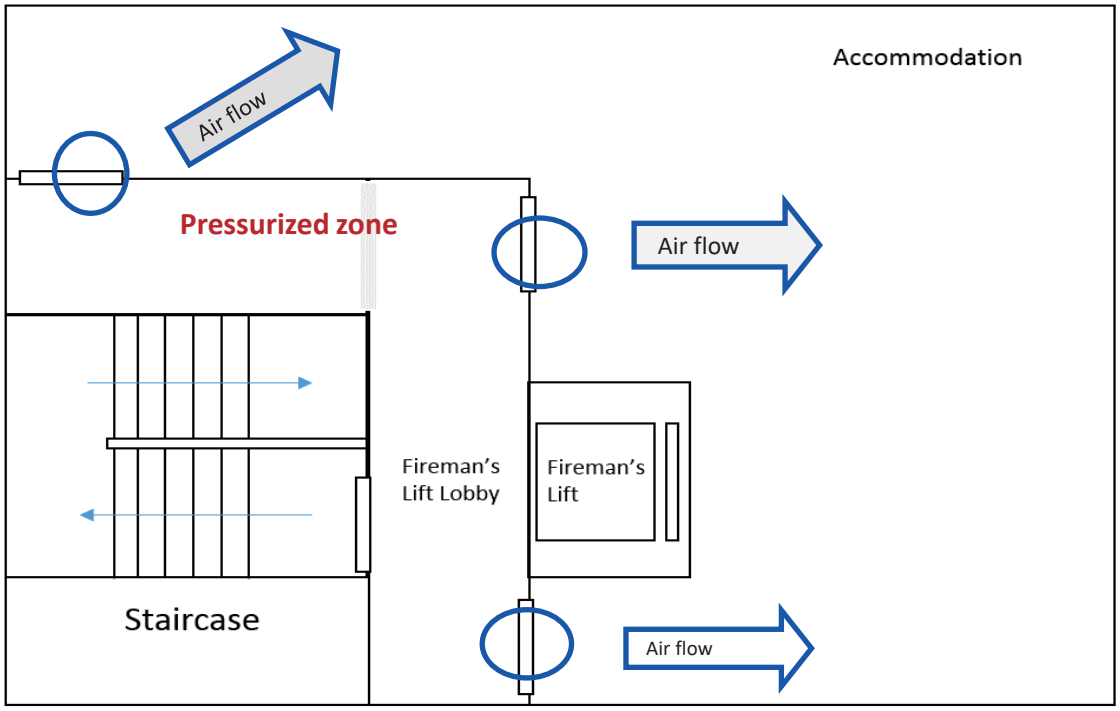


Fan Capacity will be larger to cater the required air flow

Hints on efficient SPS design

2. Early coordination between Architect, Designer of SPS

- Layout plan dominate the complexity of SPS system



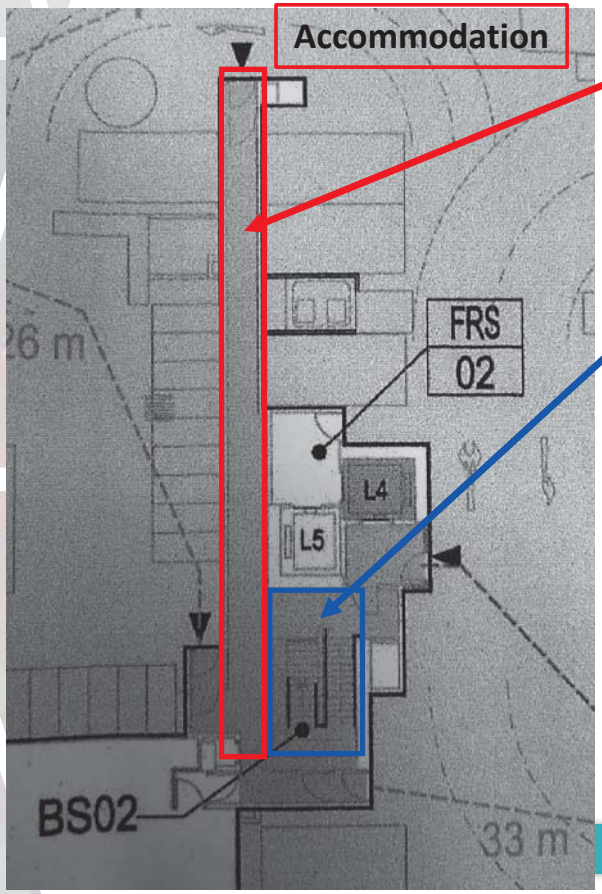
Multiple Doors

Fan Capacity will be larger to cater the required air flow

Hints on efficient SPS design

2. Early coordination between Architect, Designer of SPS

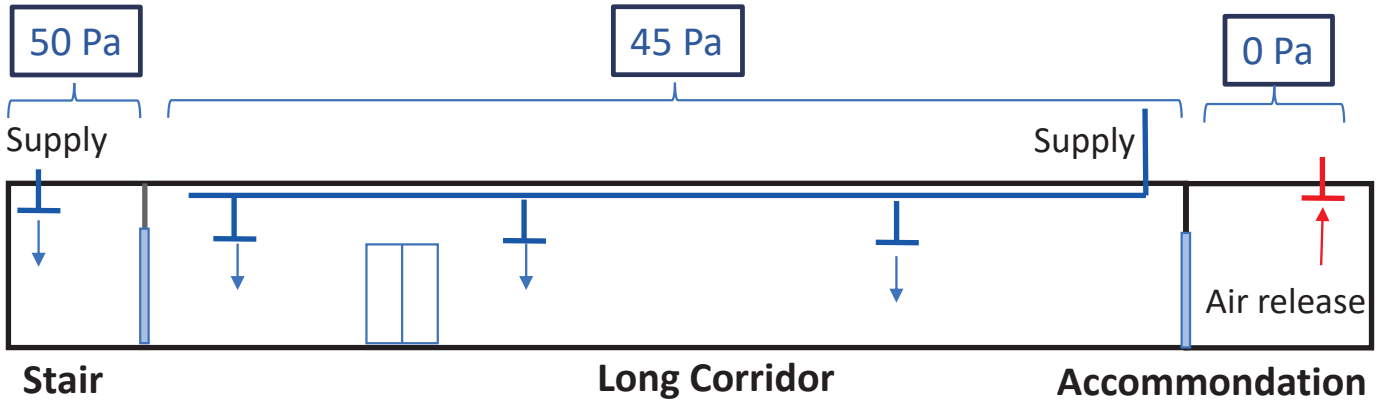
- Layout plan dominate the complexity of SPS system



Long corridor to be pressurized at 45 Pa

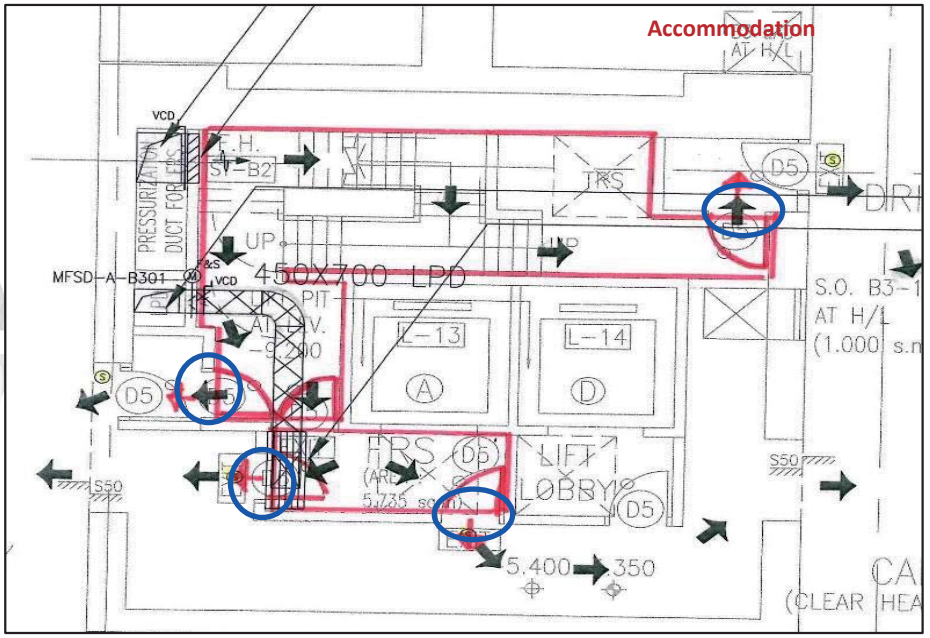
Staircase to be pressurized at 50 Pa

Long Corridor



Hints on efficient SPS design

- Complicated layout plan result in
- **Large & complicated SPS system**
- **Difficult in T&C**
- **High maintenance cost**



Hints on efficient SPS design

2. Early coordination between Architect & Designer of SPS

- Actuation device and air release should be located at common area

Hints on efficient SPS design

3. Coordination of SPS with other Fire Service Installations System

- The number of Fire Services Installations (FSI) involved will be subject to the type of premises, occupation, scale and location of premises, etc.

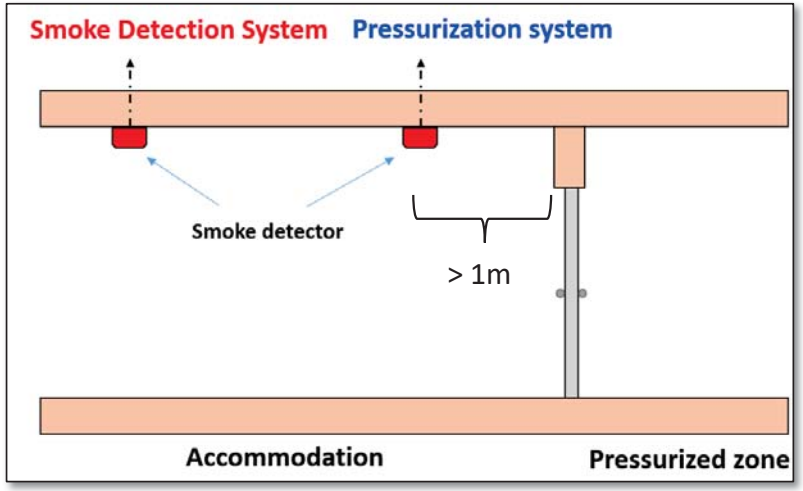
- SPS should be integrated with other systems, or vice verse, to better coordinate the response of the overall fire and life safety strategy

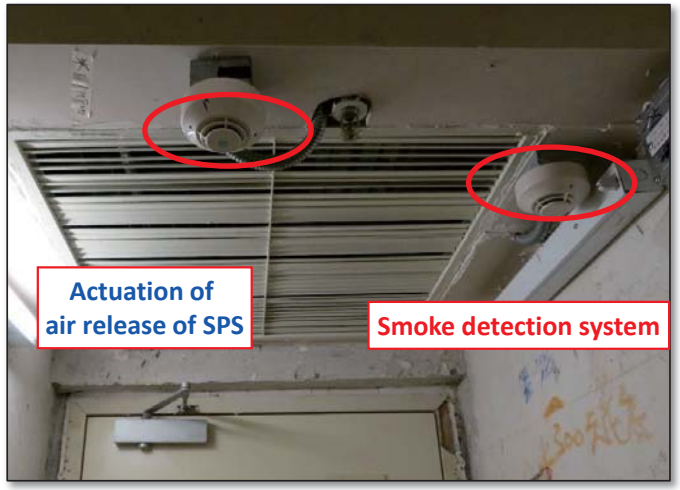
- One system should not negate the effectiveness of another

Coordination of SPS with other FSI

- " 1 m detector" for actuation of air-release system; it should be required only when a smoke detection system is NOT provided
- Cost, maintenance, false alarm
- Early coordination between designers/FS contractor of SPS and Fire Detection System

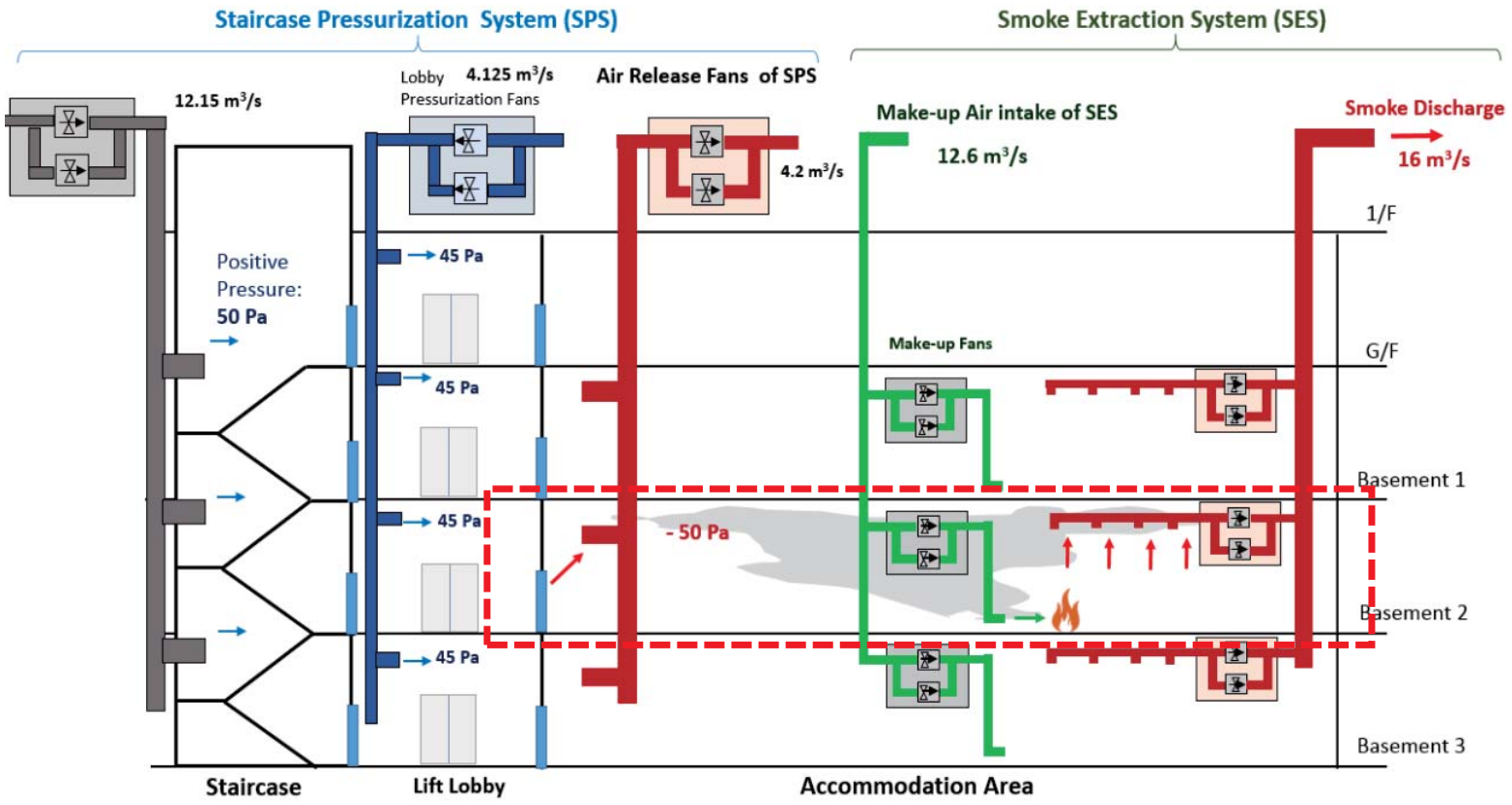
For example





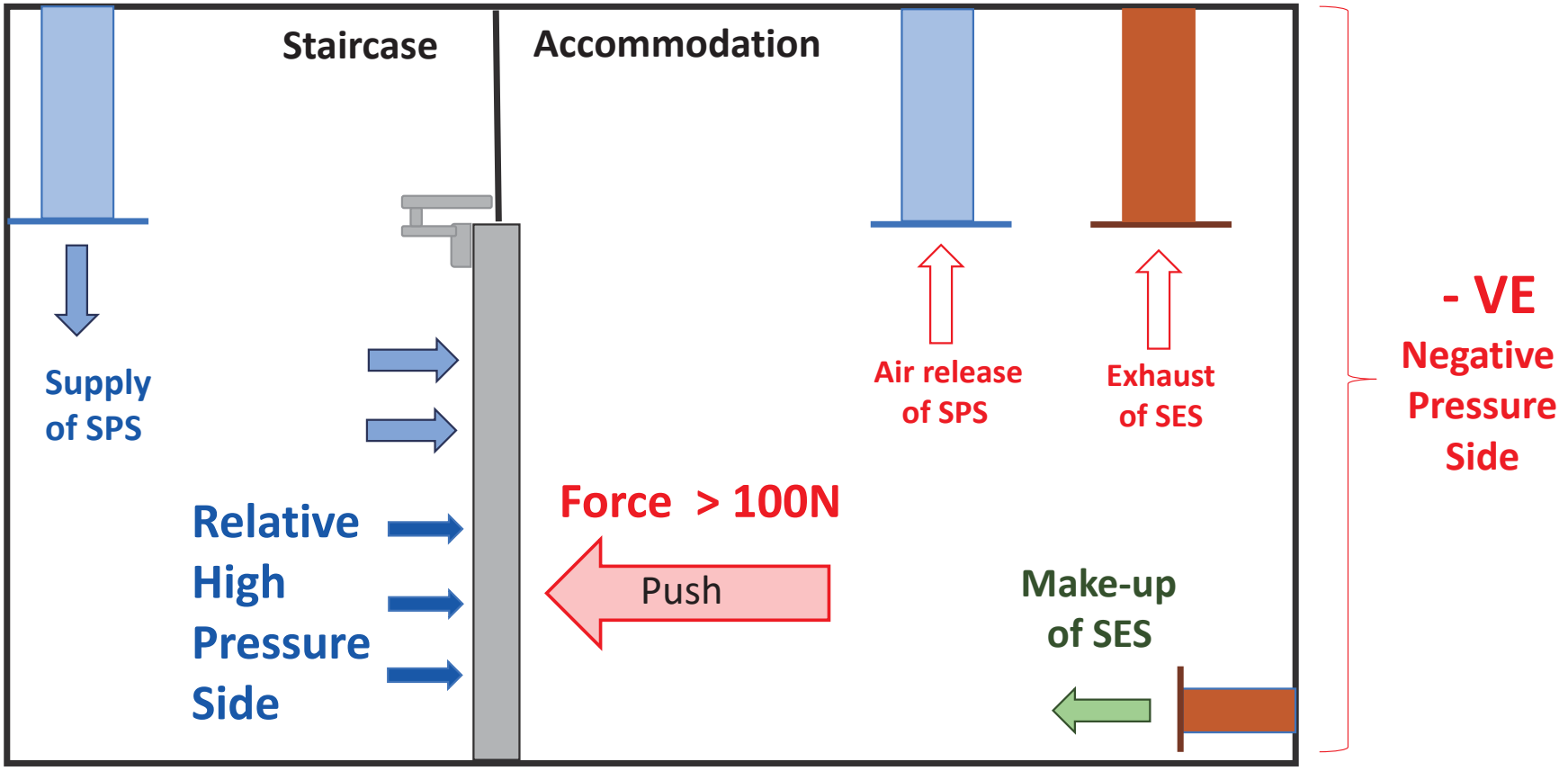
Coordination of SPS with other FSI

- When both SPS and SES actuated, the differential pressure across staircase and accommodation could be larger than 60 Pa



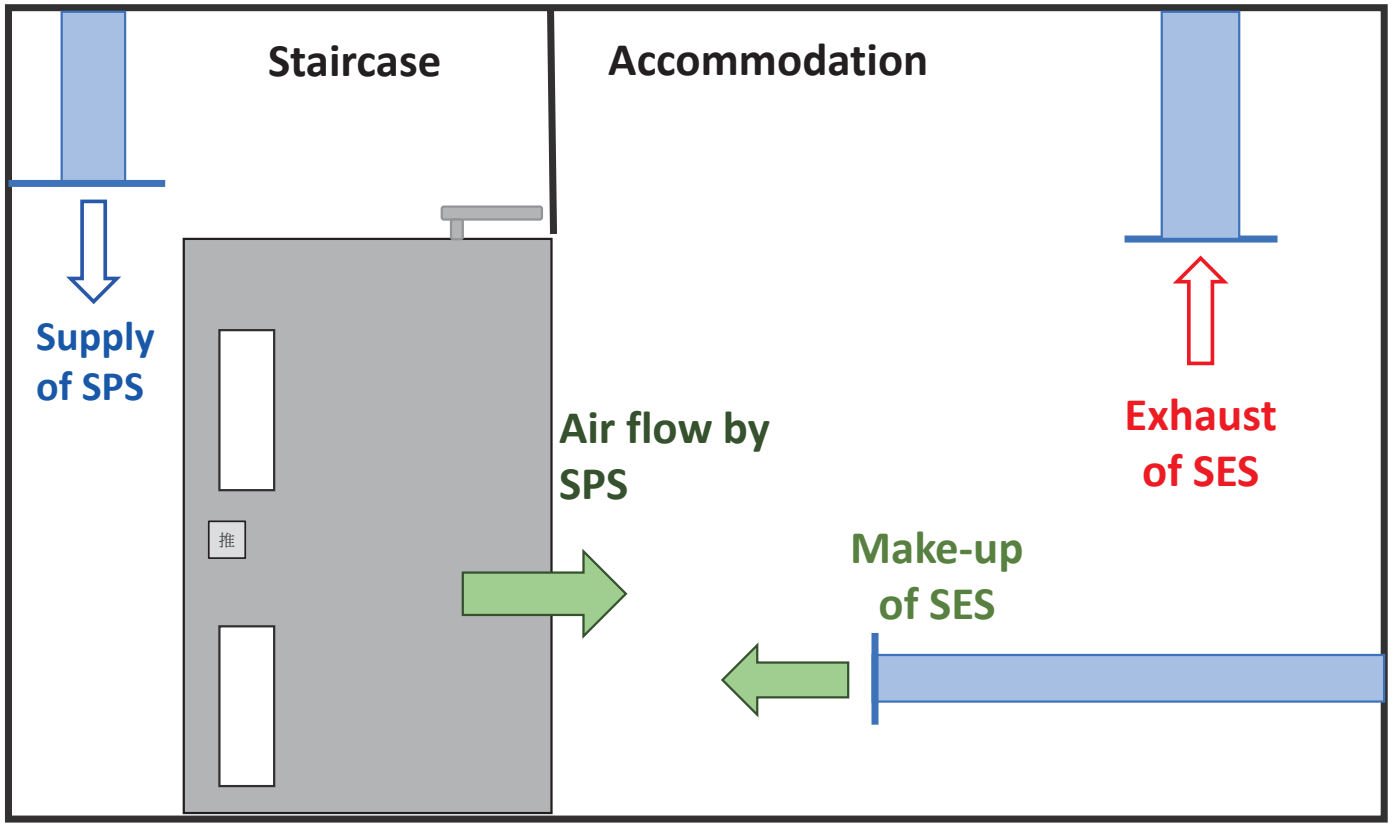
Coordination of SPS with other FSI

Actuation of both SPS and SES in tiny accommodation area



Coordination of SPS with other FSI

- As make-up of SES close to the staircase entrance, the air flow rate may be affected



To sum up

- SPS is one of the most sophistic FSI system for Smoke control
- SPS shall be **Simple**, **Reliable**, Ease of **Operation** & **Maintenance** from holistic approach
- Successful design of SPS relay on the contributions & corporation from all parties, including **Developer, Owner, Architect**, **E&M Engineer & RFSIC**

Thank You