



SCDF
The Life Saving Force

Annual Fire Safety Engineer (FSE) Dialogue Session

22 Apr 2019 (Monday)

2:30 pm

SCDF HQ

HQ SCDF Meeting Room 2 (Level 3)



Agenda :

2:30 pm to 5:00 pm

- Registration
- PB Regulatory System (update)
 - ✓ FSE Registration
 - ✓ Number of PB cases
- CPE Program (update)
- Admin Requirements (update)
- Fire Engineering Technical Requirements (update)
 - ✓ Mark-up drawings
- AOB
- QnA



Performance-Based Regulatory System



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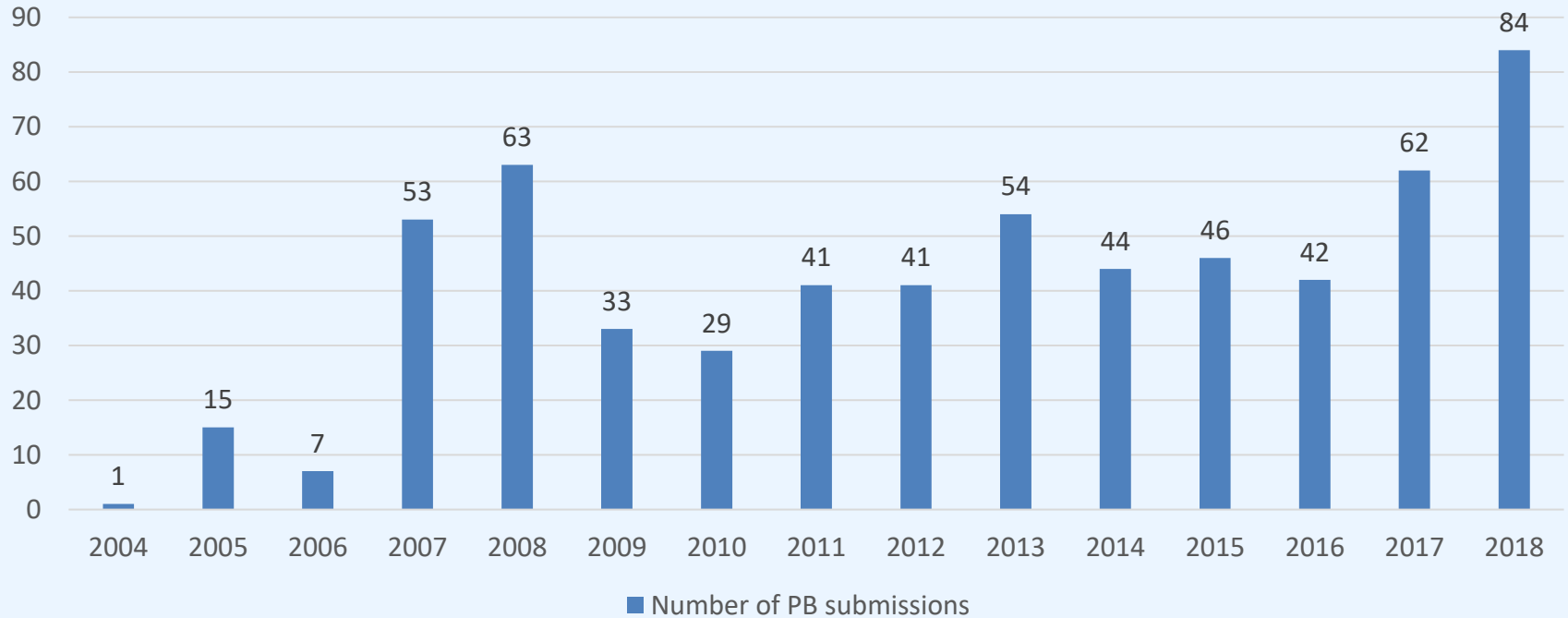
FSE registration

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
40	11	5	7	8	7	3	0	5	2	1	3	0	0	2

- ✓ Current FSEs (“Practising” & “Restriction of Practice”) – 78
- ✓ Deregistered – 16
 - Discontinue – 11
 - Uncontactable - 4
 - Passed away - 1

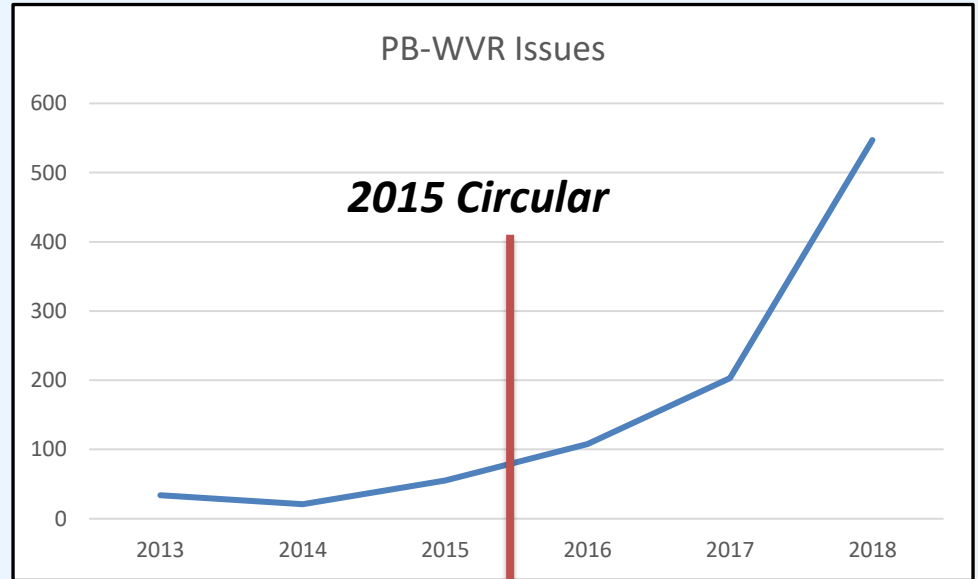


Number of PB cases



Number of PB-WVR issues

Year	PB WVR Issues
2013	34
2014	21
2015	55
2016	108
2017	203
2018	547



Number of PB cases

Upward trend.

REMINDER :

- We are not here to check your reports for you.
- FSE must check all reports before submission.
- Erroneous reports will be rejected



Continuing Professional Education Program (update)



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List of approved courses (Sep 2017 onwards)

www.scdf.gov.sg

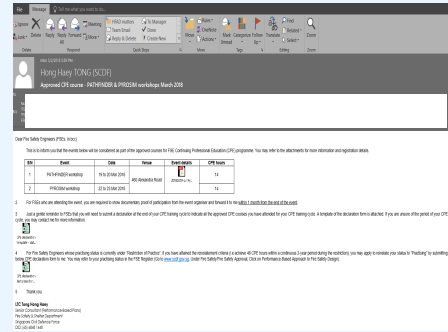
>> Fire Safety

>> Plans and Consultations

>> Performance-Based Approach to Fire Safety Design



Did anyone not receive SCDF's emails on approved CPE courses?



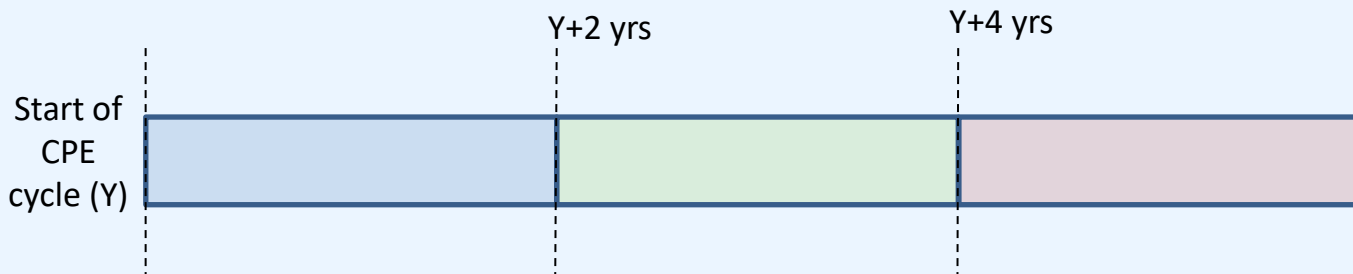
The following are the approved courses by SCDF under the FSE-CPE programme (Sep 2017 onwards):

S/N	Approved Course	Date	CPE hrs
1	WSP Building Materials Compliance Seminar	8-Sep-17	1
2	AS 1070.1 & 1070.4 Technical Solutions Workshop	26-Sep-17	2
3	AS 2118.1:2017 Seminar (Any one day, 19 Sep, 21 Sep, 22 Sep, 2 Oct, 3 Oct, 5 Oct)	Sep/Oct 2017	3
4	Combustible Cladding Forum	4-Oct-17	2
5	2017 IFF Australia Conference	5 to 6 Oct 2017	12
6	Structural/Steel Fire Design - Next Generation	9, 10, 11, 12 Oct 2017 (Any 1 day)	2
7	SPFE North America Conference & Expo	10-11 Oct 2017	10
8	SPFE North America Conference & Expo (Post conference course - Application of Fire Risk Assessment)	12-13 Oct 2017	14
9	SPFE North America Conference & Expo (Post conference course - Engineering Human Response in Fire or Engineering Analysis of Building Fires)	12-13 Oct 2017	14
10	The AS1131 Facade Test Expo	26-Oct-17	3
11	Seminar on Best Practices on Design and Testing of Fire Water Supply and Suppression Related to the Singapore Safety Case regulations	27-Oct-17	3
12	Advanced FDS and SmokeView Seminar	6 to 9 Nov 2017	26
13	FSAC workshop	15-Nov-17	9
14	FSAC conference	16 to 17 Nov 2017	18
15	Innovative Fire Protection	15-Dec-17	1
16	Victorian Cladding Taskforce	15-Dec-17	1
17	Introduction to FDS Training Course	24 to 25 Jan 2018	13
18	PATHFINDER workshop	18 to 20 Mar 2018	14
19	PROSIM workshop	22 to 23 Mar 2018	14
20	International Fire Conference & Exhibition, Malaysia	27 to 29 Mar 2018	15
21	Advanced Fire Dynamics Simulator	23 to 24 Apr 2018	14
22	Stationary Fire Purge - Beyond the Basics: Engineered Solutions to Hydraulic Challenges	23 to 24 Apr 2018	14
23	Fire and the Safety Design of Very Tall Buildings: Challenges and Strategies	23-Apr-18	7
24	Performance Based Design and Codes	24-Apr-18	7
25	SPFE Conference 2018 Hawaii	25 to 27 Apr 2018	21
26	Fire Safety Design of Buildings, Performance-Based Approach and Codes of Practice	28 Apr 2018	6
27	Fire Australia 2018 conference & tradeshow (Workshop - Professional Development Day)	1 May 2018	5
28	Fire Australia 2018 conference & tradeshow (Conference)	02 to 03 May 2018	12
29	External Fire Spread Risk in Tall Building Design	30 Apr to 04 May 2018	25
30	Fire Asia 2018	07 to 09 May 2018	10
31	3rd International Conference Fire Safety Performance-Based Design	8-Jun-18	6
32	Fire design of concrete and timber structures to Eurocode 2 and Eurocode 5	12 to 13 July 2018	10
33	Performance-Based Design for Fire Safety - Smoke Control Design	07 to 08 Aug 2018	10
34	3rd European Symposium on Fire Safety Science	12 to 14 Sep 2018	17
35	IFF Australia Conference 2018	20 to 21 Sep 2018	12
36	OpenFLAME Training Course	09 to 11 Oct 2018	18
37	13th Asia Pacific Symposium on Fire Science and Technology	21 to 25 Oct 2018	22
38	Fire Safety Design of Timber Buildings (Wood Solutions, Melbourne)	13 Nov 2018	2
39	Fire Code 2018 Seminar	8-Nov-18	10
40	Fire Protection of Building 2018	27 to 28 Feb 2019	13
41	Fire Safety Engineering Focus Workshop Series (2018) - Fire, Soot, Dispersion, and Self Protection using OpenSource CFD Software	9 to 11 Apr 2019	18
42	Application of Structural Fire Engineering, 2018	13 to 14 June 2019	13

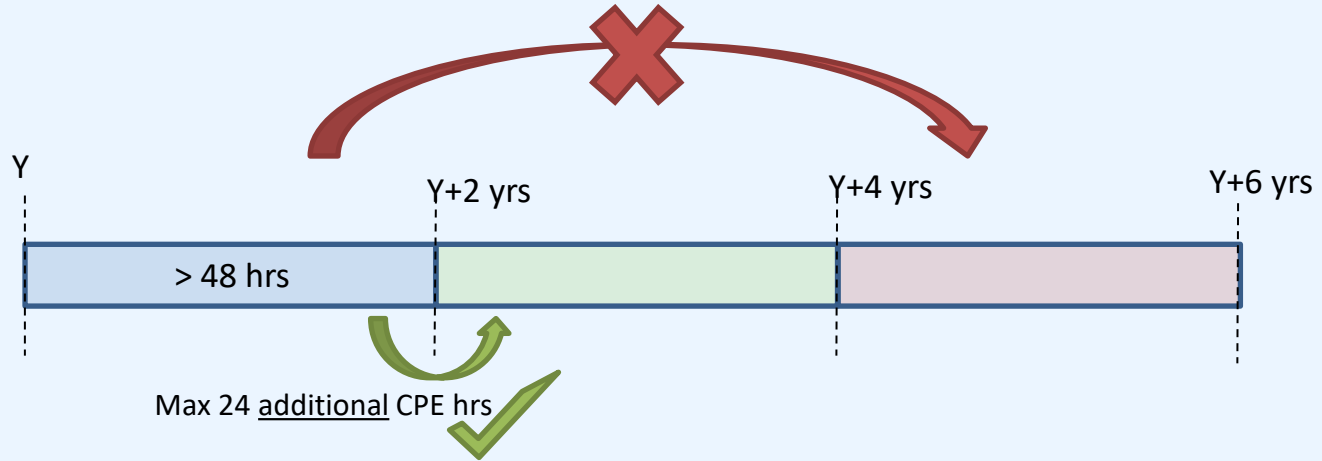
43	Evacuation For Fire Safety Engineering	09 & 10 May 2019	16
44	3rd SFPE Europe Conference	22 to 23 May 19	15
45	3rd SFPE Europe Conference (Optional Seminars) <ul style="list-style-type: none"> • Application of Fire Risk Assessment (20 May & 21 May) • Fire & Life Safety Design of Very Tall Buildings (20 May) • Performance-Based Design and Codes (21 May) 	20 May 2019 and/or 21 May 2019	7 or 14
46	Fire Design of Steel and Composite Structures to EC3 and EC4	10 to 11 June 2019	12
47	Applications of Structural Fire Engineering' 2019	13 to 14 June 2019	13
48	Interflam 2019	01 to 03 July 2019	20

CPE Program (Recap)

- Attain minimum 48 CPE hours for every 2 year-cycle. Cycle starts on:
 - 1 Sep 2013 (for FSEs registered before 1 Sep 2013)
 - FSE registration date (for FSEs registered after 1 Sep 2013)
- Different FSEs may have different CPE training cycle start/end dates
- FSE's responsibility to track and monitor own CPE training records
 - ✓ Development of CPE portal still on-going



Carry over of CPE hours (Example)



- Allow extra CPE hours (up to 24 additional CPE hrs in the immediate previous cycle) to be carried forward to the NEXT training cycle only



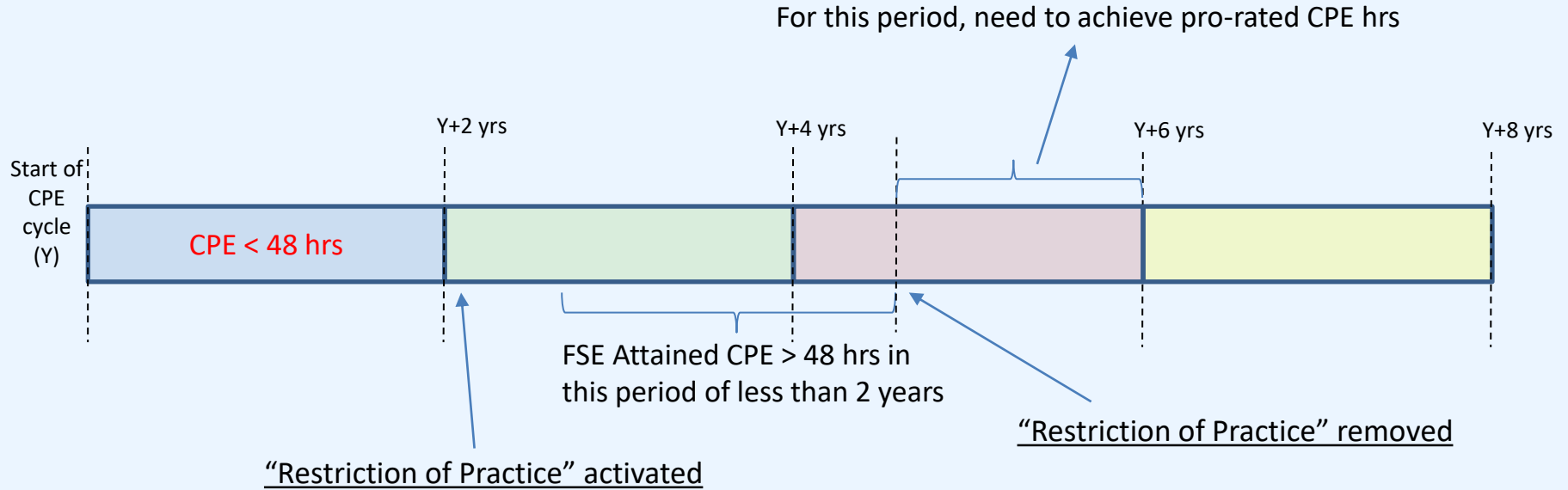
Failure to meet CPE requirements

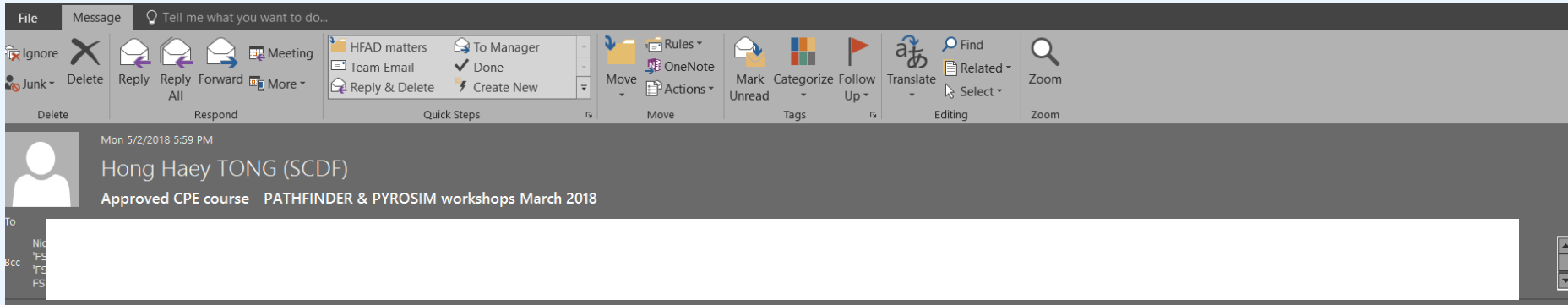
Registration Number	Registration Date	Full Name	Correspondence Address / E-mail Address	Contact Number (Office / Home / HP)	Status*
025	1 st July 2004)	Practising
026	-	-	E-mail: 105800@smgnt.com.sg	-	Not practising
027	1 st July 2004				Practising
028	-	-	-	-	Not practising
029	1 st July 2004				Restriction of Practice (From 1 Sep 2017 onwards)
030	-	-	-	-	Not practising
031	1 st July 2004				Practising
032	1 st July 2004				Restriction of Practice (From 1 Sep 2017 onwards)

Practising status listed as “Restriction of Practice” instead of “Practice” in FSE register

- Unable to submit PB plans & reports
- Existing submissions will not be processed further
- Allow reinstatement once they fulfill 48 CPE hours within a 2 year period (see example in next slide)
 - From the point of reinstatement to the end of the FSE’s cycle, need to attain pro-rated CPE hours to maintain status.
 - FSE to submit reinstatement declaration


Example





Dear Fire Safety Engineers (FSEs, in bcc)

This is to inform you that the events below will be considered as part of the approved courses for FSE Continuing Professional Education (CPE) programme. You may refer to the attachments for more information and registration details.

S/N	Event	Date	Venue	Event details	CPE hours
1	PATHFINDER workshop	19 to 20 Mar 2018	460 Alexandra Road	 20180319-20 Py...	14
2	PYROSIM workshop	22 to 23 Mar 2018			14

2 For FSEs who are attending the event, you are required to show documentary proof of participation from the event organiser and forward it to me within 1 month from the end of the event.

3 Just a gentle reminder to FSEs that you will need to submit a declaration at the end of your CPE training cycle to indicate all the approved CPE courses you have attended for your CPE training cycle. A template of the declaration form is attached. If you are unsure of the period of your CPE training cycle, you may contact me for more information.



CPE declaration
template - dat...

4 For Fire Safety Engineers whose practising status is currently under "Restriction of Practice", if you have attained the reinstatement criteria (i.e. achieve 48 CPE hours within a continuous 2-year period during the restriction), you may apply to reinstate your status to "Practising" by submitting the below CPE declaration form to me. You may refer to your practising status in the FSE Register (Go to www.scdf.gov.sg, Under Fire Safety/Fire Safety Approval, Click on Performance-Based Approach to Fire Safety Design).



CPE declaration
template (for...

5 Thank you.

LTC Tong Hong Haey
Senior Consultant (Performance-Based Plans)
Fire Safety & Shelter Department
Singapore Civil Defence Force
DID: (65) 6848 1448

www.scdf.gov.sg

>> Fire Safety
>> Plans and Consultations
>> Performance-Based Approach to Fire Safety Design

Fire Force [SG] | <https://www.scdf.gov.sg/home/fire-safety/plans-and-consultations/performance-based-approach-to-fire-sa>

The screenshot shows the SCDF website interface. At the top, the SCDF logo is displayed with the tagline 'The Life Saving Force'. To the right, the Singapore Government logo is visible with the motto 'Integrity · Service · Excellence'. Below the logo, there are links for 'Contact Info', 'Sitemap', 'Feedback', and 'FAQ'. A search bar is located on the right side of the header.

The main navigation menu includes the following items: 'About Us', 'Fire Safety', 'Civil Defence Shelter', 'NS Matters', 'Community & Volunteers', 'E-Services', and 'Join Us'. The 'Fire Safety' menu is expanded, showing a list of sub-items: 'Home Fire Alarm Device (HFAD)', 'Plans and Consultations', 'Permits and Certifications', 'Petroleum and Flammable Material Licences', 'Emergency Response Plan', 'Company Emergency Response Team (CERT)', 'Amusement Rides Approval', 'Downloads', 'E-Services', and 'Useful Links'. The 'Plans and Consultations' sub-menu is further expanded, listing: 'Plan Approval', 'Consultations', 'Waiver Application', 'Minor Addition/Alteration Works', 'Performance-Based Approach to Fire Safety Design', and 'Building Materials'. The 'Performance-Based Approach to Fire Safety Design' item is highlighted in orange.

Below the navigation menu, there is a 'Hotlines' section with a phone icon. To the right, there is a 'General Enquiries' section with the phone number '1800 286 5555'. The main content area features a large heading 'Performance-Based Approach to Fire Safety Design' and a paragraph of text: 'The performance-based approach to fire safety design relies on the use of fire engineering principles, calculations and/or appropriate software modelling tools to satisfy the intentions of the Code of Practice for Fire Precautions in Buildings 2013 (Fire Code). This new approach provides alternative means of meeting the intentions of the Fire Code. Building practitioners will have the'.



www.scdf.gov.sg

>> Fire Safety

>> Plans and Consultations

>> Performance-Based Approach to Fire Safety Design

Performance-Based Approach to Fire Safety Design

- Registration for Fire Safety Engineers
- List of Projects involving Performance-Based Fire Safety Design
- List of approved CPE course
- Fire Safety Engineers (FSE) Dialogue Session
- Register of Fire Safety Engineers
- Performance-Based Plan Approval Process
- Performance-Based Provisions
- Performance-Based Provisions Code Structure
- Frequently Asked Questions

The screenshot shows the SCDF website interface. At the top, there is a green header with a plus sign. Below it, the breadcrumb trail reads: Defence Force [SG] | <https://www.scdf.gov.sg/home/fire-safety/plans-and-consultations/performance-based-approach-to-fire-safety>. A dark blue navigation bar contains the following menu items: About Us, Fire Safety, Civil Defence Shelter, NS Matters, Community & Volunteers, E-Services, and Join Us. Below this bar, a secondary navigation bar lists: SGFPC, CDA, NSTI, NCDCC, Save-A-Life, and Innovation Challenge. The main content area features a grid of nine blue rectangular buttons with white text, arranged in three rows and three columns. The buttons are: Row 1: Registration for Fire Safety Engineers (FSE), List of Projects involving Performance-Based Fire Safety Design, List of approved CPE course; Row 2: Performance-Based Provisions, Performance-Based Provisions Code Structure, Frequently Asked Questions; Row 3: Fire Safety Engineers (FSE) Dialogue Session, Register of Fire Safety Engineers, Performance-Based Plan Approval Process.

Admin Requirements Update



SCDF
The Life Saving Force



Expedited approval of Industrial FEDBs

(Effective : 14/1/19)

Declaration by FSE to be on front page of FEDB report:

1. Fractional Effective Dose is not adopted as an acceptance criteria.
2. This FEDB submission complies with the guidelines stipulated in the Singapore Fire Safety Engineering Guidelines (SFEG).



Expedited approval of Industrial FEDBs

(Effective : 14/1/19)

1. SCDF may impose additional requirements and request for additional fire engineering assessments at the FER stage.
2. SCDF may still audit the FEDB. FSE will then receive comments/queries from SCDF.

Note: “Expedited” ≠ “Immediate”. “Expedited approval” also does not mean SCDF blindly approve ALL such submissions. Some Industrial FEDBs may still be reviewed (See LTC Tong’s email to all FSEs on 8th Jan 2019).

Kindly do not send wrong message to your clients and the building industry.

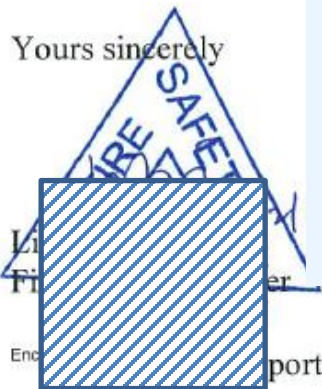


Expedited approval of Industrial FEDBs (Effective : 14/1/19)



We declare that in this Fire Engineering Design Brief (FEDB) report (Issue dated 19 February 2019):

- Fractional Effective Dose (FED) is not adopted as an acceptance criterion; and,
- This FEDB submission complies with the guidelines stipulated in the Singapore Fire Safety Engineering Guidelines (SFEG).



Good
example

Critical elements:

1. FSE's declaration
2. FSE's endorsement



Purpose Group VIII: Industrial Building (Warehouse)

DECLARATION:

- a. Fractional Effective Dose is not adopted as an acceptance criterion.
- b. This FEDB submission complies with the guidelines stipulated in the Singapore Fire Safety Engineering Guidelines (SFEG).



The Life Saving Force

Expedited approval of Industrial FEDBs

(Effective : 14/1/19)

Negative examples that would be
rejected

Fire Safety Engineering Design Brief

- a) Fractional Effective Dose is not adopted as an acceptance criteria.
- b) This FEDB submission complies with the guidelines stipulated in the Singapore Fire Safety Engineering Guidelines (SFEG).

PROPOSED NEW ERECTION OF A SINGLE USER 5-STOREY FACTORY WITH 2

PROPOSED NEW ERECTION OF A 7-STOREY SINGLE-USER WAREHOUSE DEVELOPMENT ON LOT 04447C MK 7 AT 118 PIONEER ROAD (TUAS PLANNING AREA)

Industrial Fire Engineering Design Brief (FEDB)

- Fractional Effective Dose is not adopted as an acceptance criteria.
- This FEDB submission complies with the guidelines stipulated in the Singapore Fire Safety Engineering Guidelines (SFEG).

Issue 8

- Word “Declaration” is missing
- FSE endorsement is missing

Fire Engineering Design Brief

Proposed Engineering Smoke Control System to Proposed Erection of a Block of 7-Storey Single-User Food Industrial Development with Temporary Ancillary Workers Dormitory (For 132 Workers) and Industrial Canteen on Lot MK13-06296W at Woodlands Ave 12 (Woodlands Planning Area)

Prepared by Jumariko Haryanto

Approved by Lim Gim Seng (FSE)

Revision : 0

Fractional Effective Dose is not adopted as an acceptance criteria

This FEDB submission complies with the guidelines stipulated in the SFEG

Uploading of fire engineering modelling (fire/evac/structural) source codes

Reminder : This is a requirement for all Fire Engineering Reports.
(FER & WVR-FER)



-----Original Message-----

From: Mail Hygiene <noreply_mailfilter@support.gov.sg>

Sent: Monday, 29 October 2018 12:05 PM

To: Nicholas LEE (SCDF) <Nicholas_LEE@scdf.gov.sg>

Subject: Message Notification

Mail Hygiene
Unable to accept .fds files.

NOTIFICATION FROM SG-Mail:

The email sent by [REDACTED] Mail - 180003-FSSD - SCDF Licences & Permits WVR_ACK_EXT " has been blocked as it contains one or more attachment(s) which potentially could pose security risk.

List of attachment(s) found in the email: "idd_A9A51AAA-FA77-4D9F-BD27-EBA7894C59[E.pdf], S1-WVR0268718.fds"

Please advise [REDACTED] to change the file type to an acceptable format before resending the email. Please contact your IT department to identify the unauthorised content.

*** This is a system generated message, please do not reply. ***

Email server unable to accept source codes (e.g. zip files, .fds files, etc). Only pdf attachments are accepted via emails.

Solution to submit source codes – Zip up the files before uploading through corenet correspondence.

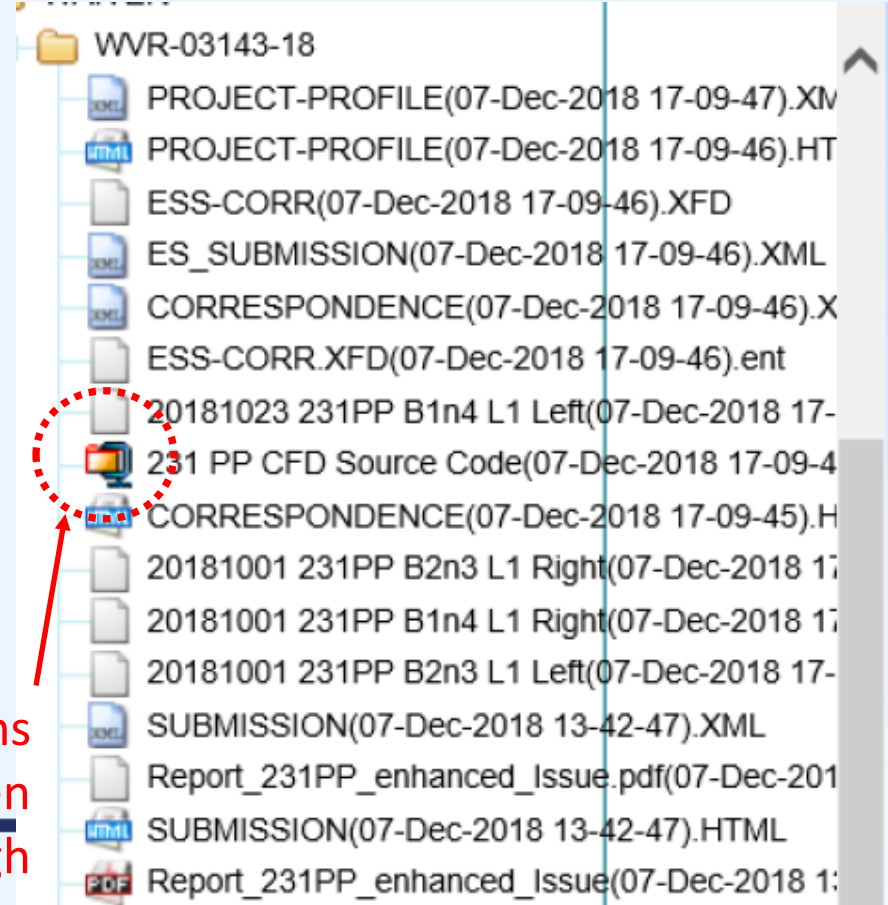
Steps

1. Corenet correspondence

- *Note: SCDF does not receive immediately*
- *(>24 hrs turnaround)*

2. Email notification to processing officer

Zip icon that confirms that fds files have been sent through



File uploads via CORENET correspondence

- File size (of each file) generally should not exceed 20 MB to prevent the file being dropped during transmission.
- Many cases of file size exceeding 50 MB and dropped during file transmission to SCDF.
- Applies to source codes as well as other documents.



Non-compliance to Fire Code clauses involving car park ductless jet fans

- To address via PB waivers instead of full performance-based submissions.
 - I. Transient space
 - II. Car park generally lower occupant loading
 - III. Issues are standard:
 - a. Enlarged smoke zone
 - b. Clear height
 - c. Distance between jet fan during design/installation



Reminder on Declaration of compliance by QP, FSE, and Peer Reviewer (FSER Submission)

- **Mandatory – As required by Fire Safety (Bldg & Pipeline FS) Regulations**
- Submission will be **disapproved** if declaration is absent.
- 2 types of performance-based (PB) submission declaration form
 - QP & FSE of the submission are the same person (FORM 2)
 - Declaration form requires endorsement by **2 pax** - QP(who is also FSE) & Peer Reviewer (PR)
 - QP & FSE are different persons (FORM 3)
 - Declaration form requires endorsement by **3 pax** – QP & FSE & PR
- Declaration form for PB submission is available on SCDF website.
 - www.scdf.gov.sg >> Fire Safety >> Downloads >> Forms



Reminder on Declaration of compliance by QP, FSE, and Peer Reviewer (FSER Submission)

- **Mandatory – As required by Fire Safety (Bldg & Pipeline FS) Regulations**
- Declaration form to be submitted in a standalone pdf file (labelled as *PB Declaration.pdf*).
- Submitted together with:
 1. FSER
 2. FEDB
 3. O&M Manual
 4. Peer Reviewer Report
 5. **PB Declaration**



Declaration of compliance by QP (who is also project FSE), and Peer Reviewer (FORM 2)

FORM 2

FIRE SAFETY ACT
(CHAPTER 109A)

FIRE SAFETY (BUILDING FIRE SAFETY) REGULATIONS

The Commissioner
Singapore Civil Defence Force
91 Ubi Avenue 4
Singapore 408827

Proposal _____

*Lot/Plot _____ *TS/MK _____

Address/Road _____

QP(FSE)

Part I

To be completed by the qualified person who is a fire safety engineer and who prepares the plans of fire safety works which include any alternative solution, and the fire safety engineering report.

I, _____, NRIC No./Passport No. _____
being a qualified person and a fire safety engineer under the Fire Safety Act,
hereby certify that—

- the fire safety works as shown on these plans have been designed in accordance with the provisions of the Fire Code, the Fire Safety Act and any regulations made ~~thereunder~~, the relevant codes of practice and design guidelines, subject to modifications or waivers under section 27 of the Fire Safety Act; and
- the alternative solution in the plans, and the fire safety engineering report, satisfy the fire performance requirements in the Fire Code, and comply with the Fire Safety Act and any regulations made ~~thereunder~~, the relevant codes of practice and design guidelines, subject to any deviation or modification approved by the Commissioner.

(Name and signature of
qualified person/fire safety engineer)

(Address of qualified person/
fire safety engineer)

Date: _____

Peer Reviewer

Part II

To be completed by the peer reviewer who reviews the alternative solution in the plans of fire safety works and the fire safety engineering report.

I, _____, NRIC No./Passport No. _____ being
a peer reviewer under the Fire Safety Act, hereby certify that the alternative
solution shown on these plans, and the fire safety engineering report (*satisfy/
do not satisfy/partially satisfy, subject to the conditions stated in my peer
reviewer's report) the fire performance requirements in the Fire Code, and
comply with the provisions of the Fire Safety Act and any regulations made
~~thereunder~~, the relevant codes of practice and design guidelines, subject to any
deviation or modification approved by the Commissioner.

(Name and signature of peer reviewer)

(Address of peer reviewer)

Date: _____

*delete whichever is inapplicable



Declaration of compliance by QP, FSE and Peer Reviewer (FORM 3)

FORM 3

FIRE SAFETY ACT
(CHAPTER 109A)

FIRE SAFETY (BUILDING FIRE SAFETY) REGULATIONS

DECLARATION FORM

The Commissioner
Singapore Civil Defence Force
91 Ubi Avenue 4
Singapore 408827

Proposal _____

*Lot/Plot _____ *TS/MK _____

Address/Road _____

QP

Part I

To be completed by a qualified person who is not a fire safety engineer and who prepares the plans of fire safety works, and prepares the alternative solution in the plans under the supervision of a fire safety engineer.

I, _____, NRIC No./Passport No. _____ being a qualified person under the Fire Safety Act, hereby certify that —

- the fire safety works as shown on these plans have been designed in accordance with the provisions of the Fire Code, the Fire Safety Act and any regulations made ~~thereunder~~, the relevant codes of practice and design guidelines, subject to modifications or waivers under section 27 of the Fire Safety Act; and
- the alternative solution in the plans adheres to the fire safety engineering report.

(Name and signature of qualified person)

(Address of qualified person)

Date: _____

FSE

Part II

To be completed by the fire safety engineer who is not a qualified person and who supervises the preparation of the alternative solution in the plans of fire safety works, and prepares the fire safety engineering report.

I, _____, NRIC No./Passport No. _____ being a fire safety engineer under the Fire Safety Act, hereby certify that the alternative solution shown on these plans, and the fire safety engineering report, satisfy the fire performance requirements in the Fire Code, and comply with the provisions of the Fire Safety Act and any regulations made ~~thereunder~~, the relevant codes of practice and design guidelines, subject to any deviation or modification approved by the Commissioner.

(Name and signature of fire safety engineer)

(Address of fire safety engineer)

Date: _____

Peer Reviewer

PART III

To be completed by the peer reviewer who reviews the alternative solution in the plans of fire safety works and the fire safety engineering report.

I, _____, NRIC No./Passport No. _____ being a peer reviewer under the Fire Safety Act, hereby certify that the alternative solution shown on these plans, and the fire safety engineering report (*satisfies/ do not satisfy/ partially satisfies, subject to the conditions stated in my peer reviewer's report.) the fire performance requirements in the Fire Code, and comply with the provisions of the Fire Safety Act and its regulations, the relevant codes of practice and design guidelines, subject to any deviation or modification approved by the Commissioner.

(Name and signature
of peer reviewer)

(Address of peer reviewer)

Date: _____

*delete whichever is inapplicable²¹.



SCDF
The Life Saving Force



FIRE SAFETY ACT
(CHAPTER 109A)

FIRE SAFETY (BUILDING FIRE SAFETY) REGULATIONS

DECLARATION FORM

The Commissioner
Singapore Civil Defence Force
91 Ubi Avenue 4
Singapore 408827

PROPOSED 6-STORY ACADEMIC BLOCK WITH 1 BASEMENT AND 1 SINGLE-STOREY M&E ANCILLARY BLOCK AT NANYANG TECHNOLOGICAL UNIVERSITY ON LOTS 00173W, 00174V, 00175P, 00176T, 00177A, 00178K, 00179N, 00180A, 00181K, 00182N, 00183X, 00184L, 00185C, 00186M MK 08 AND LOTS 00029L, 00384T, 00385A, 00392L, 01285K, 01286N, 01287X, 01288L, 01289C MK 09 AT NANYANG DRIVE (WILTERN WATER CATCHMENT PLANNING AREA)

Part I

To be completed by a qualified person who is not a fire safety engineer and who prepares the plans of fire safety works, and prepares the alternative solution in the plans under the supervision of a fire safety engineer.

I, [REDACTED], NRIC No. [REDACTED], being a qualified person under the Fire Safety Act, hereby certify that—

- the fire safety works as shown on these plans have been designed in accordance with the provisions of the Fire Code, the Fire Safety Act and any regulations made thereunder, the relevant codes of practice and design guidelines, subject to modifications or waivers under section 27 of the Fire Safety Act; and
- the alternative solution in the plans adheres to the fire safety engineering report.

[REDACTED]

(Name and signature of qualified person)

[REDACTED]

(Address of qualified person)

Date:

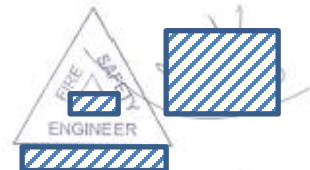
[REDACTED]

*Delete whichever is inapplicable

Part II

To be completed by the fire safety engineer who is not a qualified person and who supervises the preparation of the alternative solution in the plans of fire safety works, and prepares the fire safety engineering report.

I, [REDACTED], NRIC No./Passport No. [REDACTED] being a fire safety engineer under the Fire Safety Act, hereby certify that the alternative solution shown on these plans, and the fire safety engineering report, satisfy the fire performance requirements in the Fire Code, and comply with the provisions of the Fire Safety Act and any regulations made thereunder, the relevant codes of practice and design guidelines, subject to any deviation or modification approved by the Commissioner.



(Name and signature of fire safety engineer)

[REDACTED]

(Address of fire safety engineer)

Date:

[REDACTED]

*Delete whichever is inapplicable

PART III

To be completed by the peer reviewer who reviews the alternative solution in the plans of fire safety works and the fire safety engineering report.

I, [REDACTED], NRIC No./Passport No. [REDACTED] being a peer reviewer under the Fire Safety Act, hereby certify that the alternative solution shown on these plans, and the fire safety engineering report (~~*satisfies / do not satisfy / partially satisfies, subject to the conditions stated in my peer reviewer's report~~) the fire performance requirements in the Fire Code, and comply with the provisions of the Fire Safety Act and its regulations, the relevant codes of practice and design guidelines, subject to any deviation or modification approved by the Commissioner.

[REDACTED]

(Name and signature of peer reviewer)

[REDACTED]

(Address of peer reviewer)

Date:

[REDACTED]

*Delete whichever is inapplicable

Example of Declaration Form



Fire Engineering Technical Requirements Update



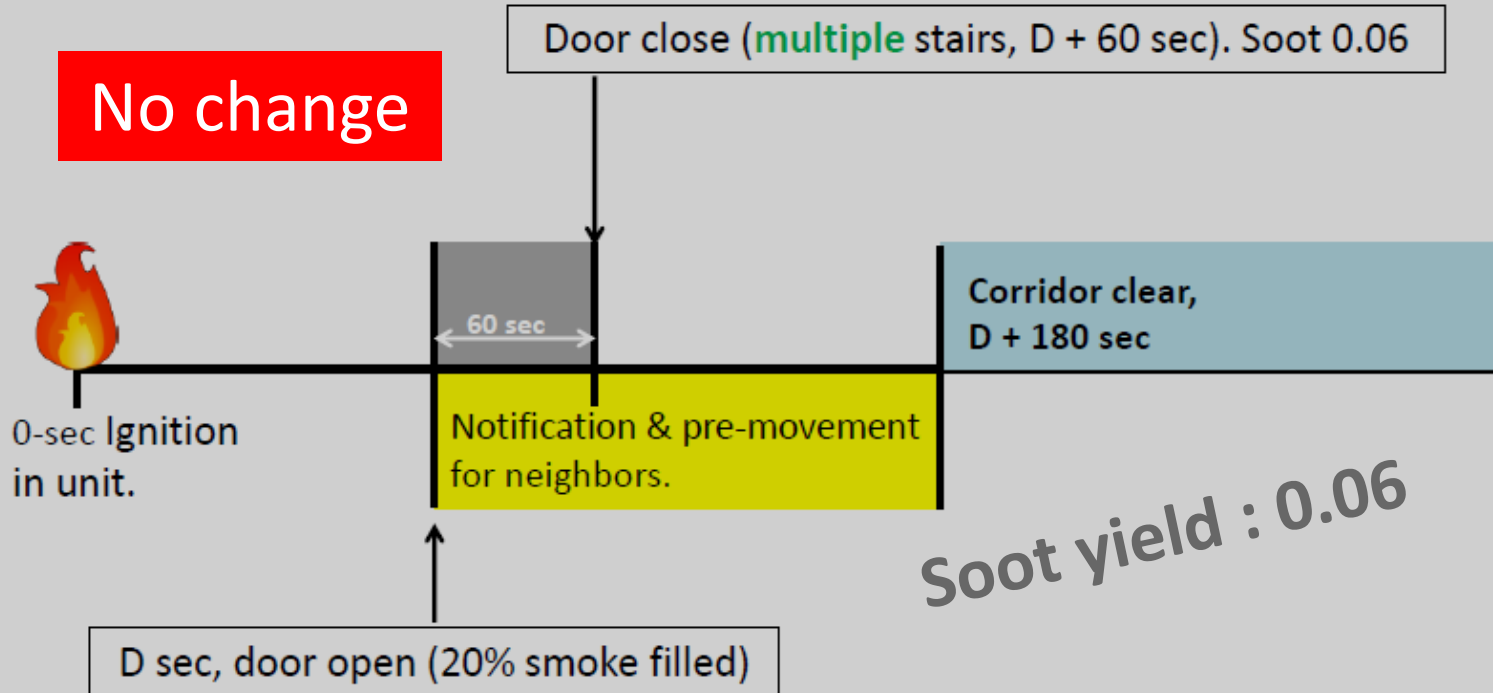
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Acceptance Criteria for residential corridors.

180 seconds after door opens, at the height of $Z = 2\text{m}$:

1. Visibility for the whole corridor must **exceed 10m** &
2. Temperature for the whole corridor must be **less than 60°C**.

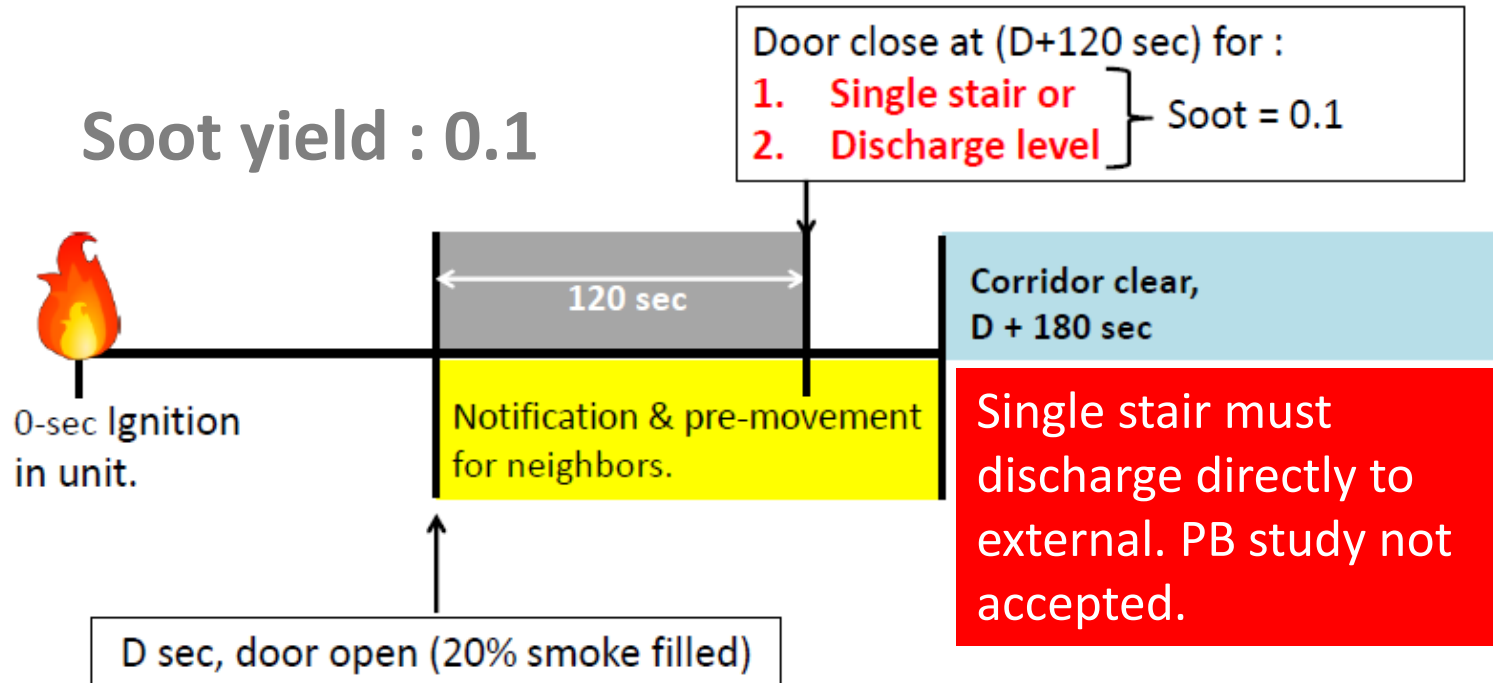


Acceptance Criteria for residential corridors.

180 seconds after door opens, at the height of $Z = 2\text{m}$:

1. Visibility for the whole corridor must **exceed 10m** &
2. Temperature for the whole corridor must be **less than 60°C**.

Soot yield : 0.1



Guidelines for Acceptance Criteria for exit staircases.

At all staircase landings at Z=1.7m :

- 1. Temperature $< 60^{\circ}$**
- 2. Visibility $> 10\text{m}$**

Throughout whole exit stair

- 3. FED < 0.3**



Linking all deviations

Deviations

(1) Table of deviations

Deviation	Issues
D1	TD - 76m > 60m
D2	Smk res - 3,000 m ² > 2,000 m ²
D3	Setback - 3.5m < 4.5m
D4	Internal discharge - 14m > 10m

Fire Scenarios

(2) Fire scenarios

Scenario	Deviation	HRR	Soot
F1	D1, D2	5 MW	0.1
F2	D3	10 MW	0.1
F3	D4	5 MW	0.1

Acceptance
Criteria

(3) Acceptance Criteria

ASET/RSET (D1, D2 & D4)

12.6 kW/m² (D3)

2.5 kW/m² (D4)

Mark-Up drawings



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Examples : Good

“A good mark-up drawing speaks for itself.”



**Important info needs to
be clearly seen and vice-
versa.**



L3 -Automatic warehouse
(PB Study)

L1 - L6: Warehouse
(PB Study)



L2, L5, L7: Ancillary Office
(NO PB)

Loading & Driveway Area
(PB Study)

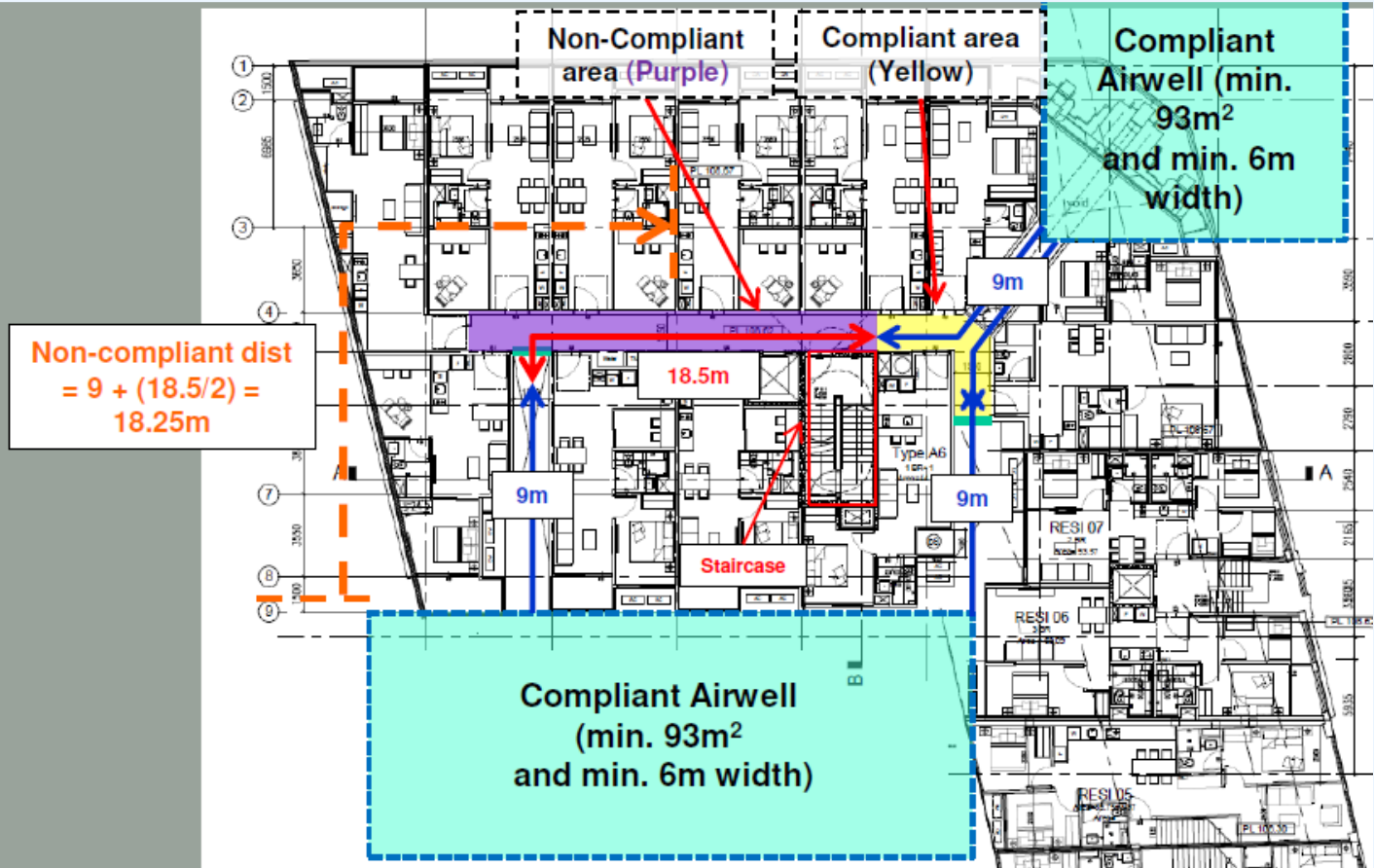
Driveway Ramp
(PB Study)

Void opening above Semi-Basement (carpark)
(NO PB)

L1 - lobby
(NO PB)

Drop Off Area
(NO PB)





LEVEL 2 & LEVEL 3
WAREHOUSE
(TYPICAL)
FLR TO FLR HEIGHT: 10.5m
STORAGE HEIGHT: 7m

L2-L3 WAREHOUSE
(PB-AREA)

D2: MV-ESCS SMOKE
RESERVOIR AREA:
 $5300\text{m}^2 > 2600\text{m}^2$

FIRE SCENARIOS
FOR LEVEL 2 ONLY
F1=5.6MW
F1S=6.72MW

NON-PB
AREA

STAIR-4

STAIR-1

STAIR-2

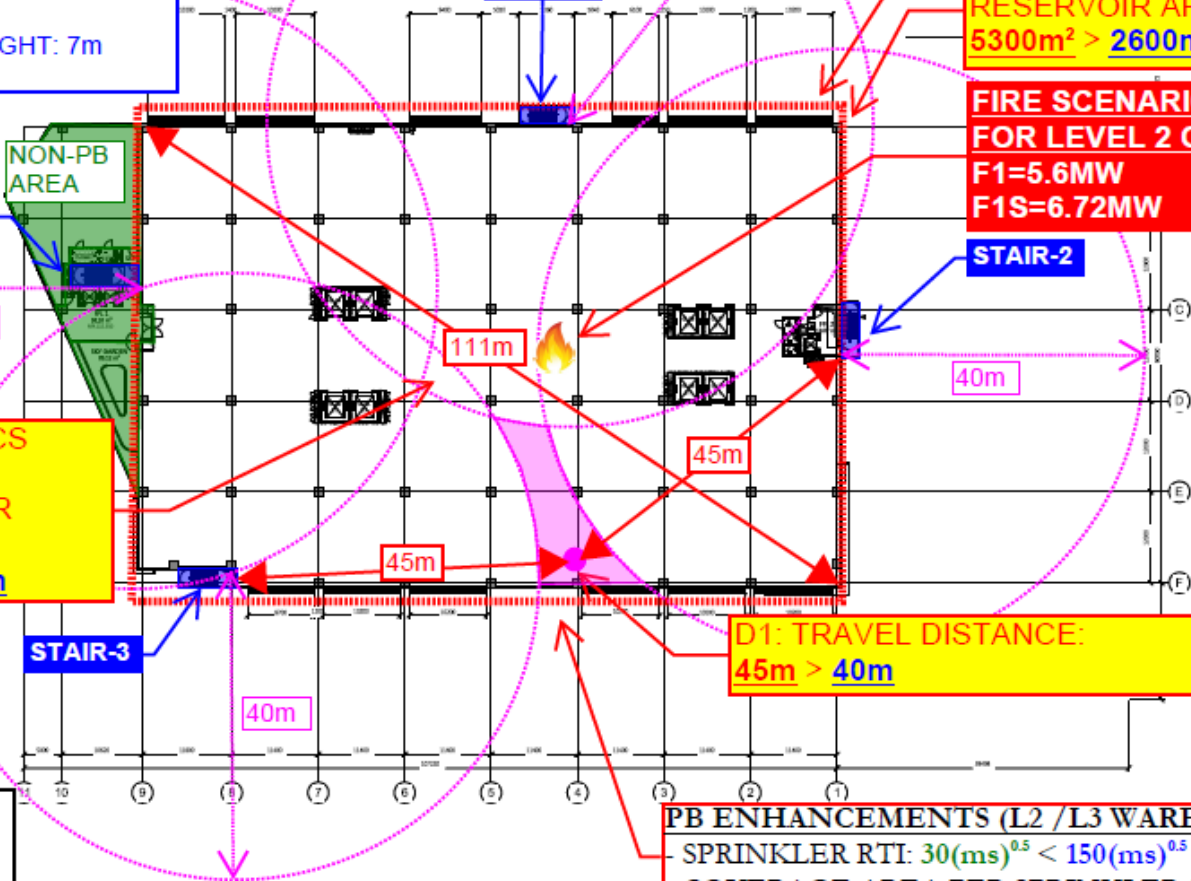
STAIR-3

D3: MV-ESCS
SMOKE
RESERVOIR
LENGTH:
 $111\text{m} > 60\text{m}$

D1: TRAVEL DISTANCE:
 $45\text{m} > 40\text{m}$

DWG NO.
FEDB/C01
16/08/2018

PB ENHANCEMENTS (L2 / L3 WAREHOUSE)
- SPRINKLER RTI: $30(\text{ms})^{0.5} < 150(\text{ms})^{0.5}$
- COVERAGE AREA PER SPRINKLER $9\text{m}^2 < 12\text{m}^2$

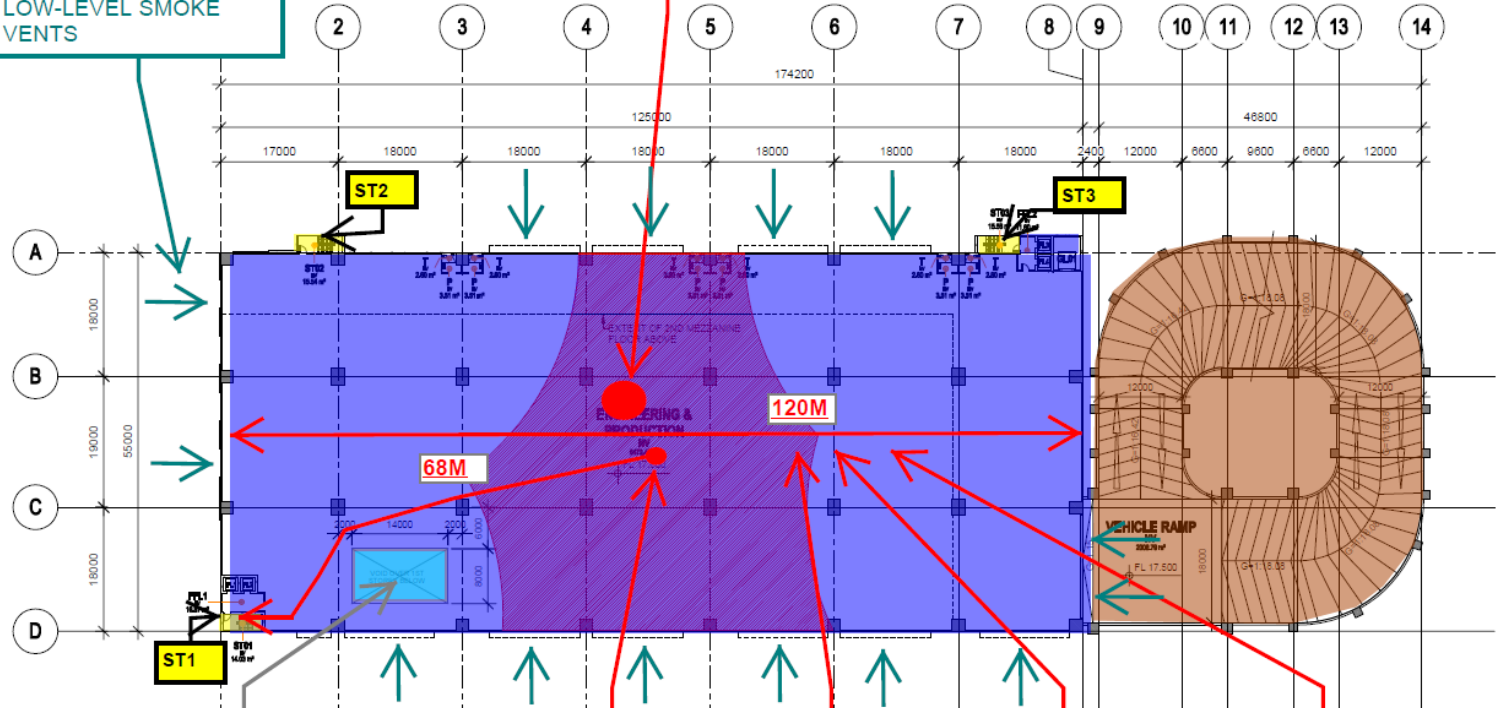


Appendix C:TD, SC Deviations & SC Fire Scenarios
 L2 to L2M (Floor to Floor Height =6.65m)
 L2 to L3 (Floor to Floor Height =12.6m)

PB Enhancements:
 a) Spk coverage per head: $9m^2 < 12m^2$
 b) Spk R.T.I. $50 (ms)^{0.5} < R.T.I. 150 (ms)^{0.5}$

LEVEL 2 WORKSHOP
 MAKE-UP AIR THROUGH
 LOW-LEVEL SMOKE
 VENTS

SC-3 : 5.3 MW
 SC-3S : 6.4 MW
 (1.2 x FIRE SIZE)



L1-L3 void (Height: 25.2m)
 - Horizontal FRS provided at L2 floor slab
 - Water monitoring system at L1
 - WVR/03105/18

D1 (SC): TRAVEL DISTANCE
68m > 40m
 (HATCHED AREA)

D4(SC): MV-ESCS SMOKE RESERVOIR
 LENGTH **120m > 60m**

D2(SC): MV-ESCS SMOKE RESERVOIR AREA
6700m² > 2600m²

D5 (SC): SPRINKLER FLOW SWITCH
 ACTIVATION
 (SMOKE DETECTION SYSTEM)

DTS Clause of Fire Code (2013)	DTS Requirements	Extend Deviation
A. Chapter 2 – Means of Escape		
A.1. Extended 2 way travel distance – 1st, 3rd, 4th & 6th Storey warehouse		
Clause 2.2.6	<p>The maximum travel distance for the respective types of occupancies shall be not greater than as laid down in Table 2.2A.</p> <p>Based on open floor plan, the maximum 2-way travel distance = 60m</p>	<p>The extended travel distance exceeds the maximum 2-way travel distance up to 75m (>60 m)</p> <ul style="list-style-type: none"> • Warehouse - 1st storey (75 m) • Warehouse – 3rd storey (75m) • Warehouse – 4th storey (75m) • Warehouse – 6th storey (75m)
A.2. Extended discharge distance for exit staircase - 1st storey warehouse		
Clause 2.3.3(c)(i)(2)	<p>The maximum distance between the discharge point of an exit staircase and the exterior open space opened to the sky shall not exceed 10m</p>	<p>The extended discharge distance from exit staircase is 19m (>10 m)</p> <ul style="list-style-type: none"> • Stair 6 at 1st storey

Good use of colours.



Examples : Bad



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Office area fire



Figure 10.1-5: Timeline Graph for Canteen Fire

Where is the fire ?



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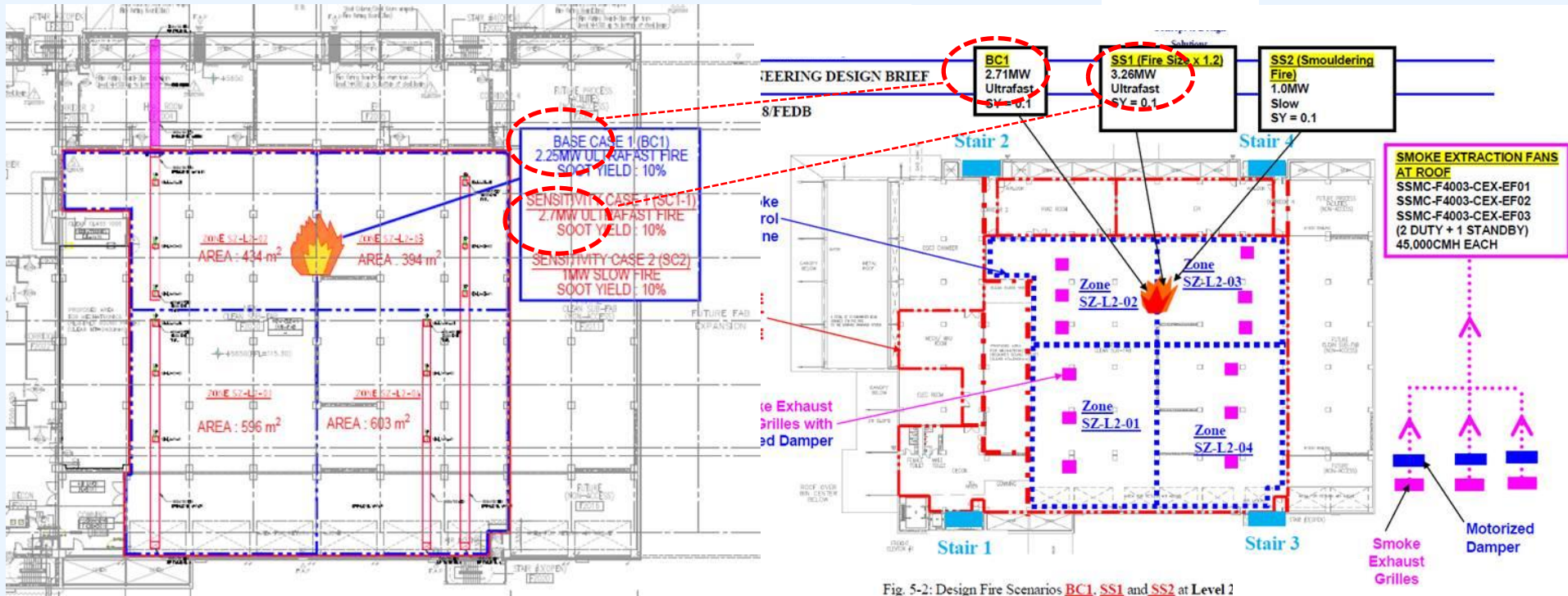


Fig. 5-2: Design Fire Scenarios **BC1**, **SS1** and **SS2** at Level 2

Fire sizes ?



SS4 with a **0.65MW** and soot yield of **0.1** is considered (refer to computational model in Figure 6.1.6-1).

Fire Scenario	Location	Fire Characteristics
SS4	Level 3 (Production Area)	0.65MW T ² Ultrafast Fire 4% Soot Yield

Soot yield ?

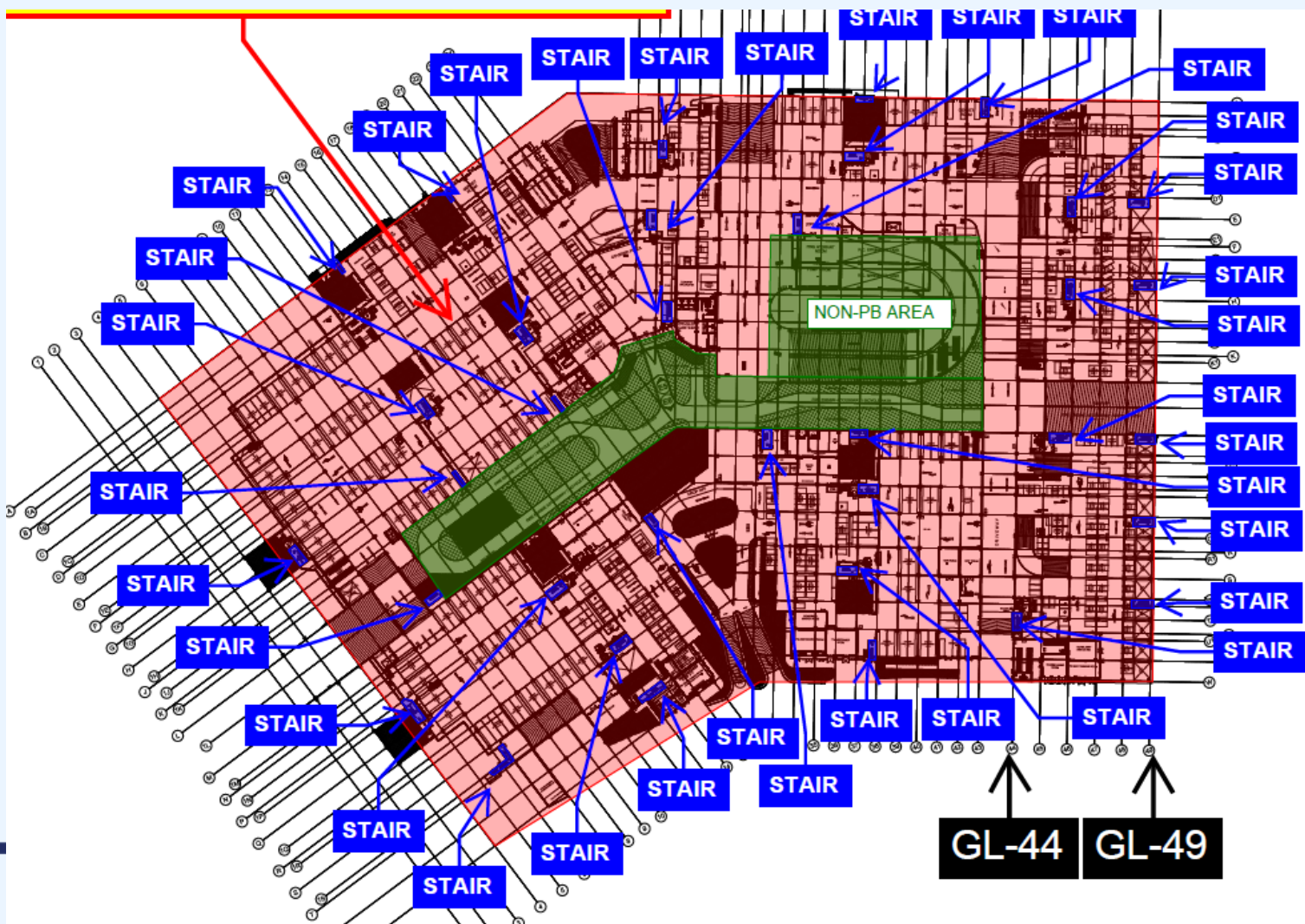


FSE said : “The CFD study was carried out to show smoke movement for comparison purposes only, and no fire engineering assessment.”



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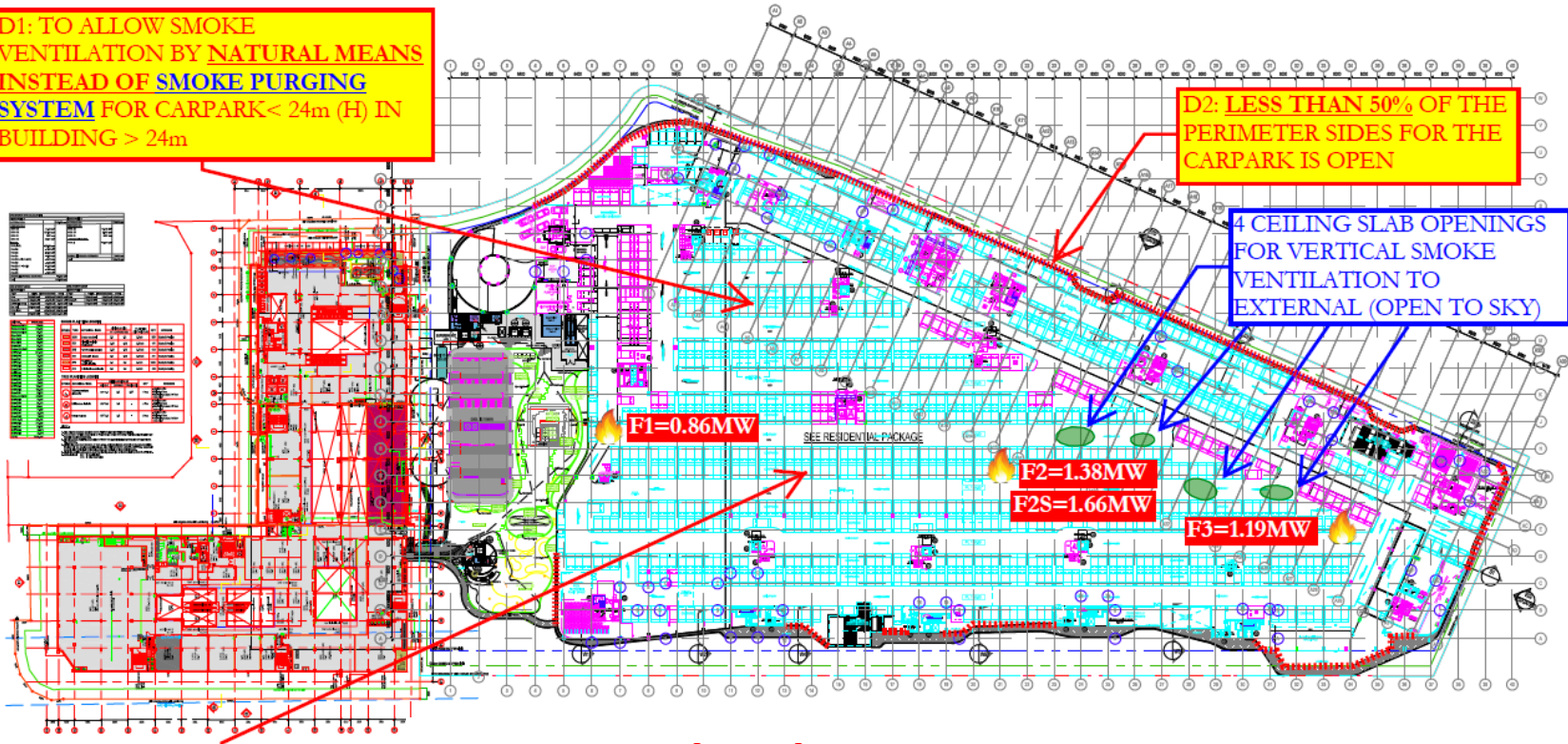




D1: TO ALLOW SMOKE VENTILATION BY NATURAL MEANS INSTEAD OF SMOKE PURGING SYSTEM FOR CARPARK < 24m (H) IN BUILDING > 24m

D2: LESS THAN 50% OF THE PERIMETER SIDES FOR THE CARPARK IS OPEN

4 CEILING SLAB OPENINGS FOR VERTICAL SMOKE VENTILATION TO EXTERNAL (OPEN TO SKY)



D3: PART OF THE CARPARK IS MORE THAN 12M FROM THE PERIMETER OPENINGS < 12m

12m must be shown clearly.

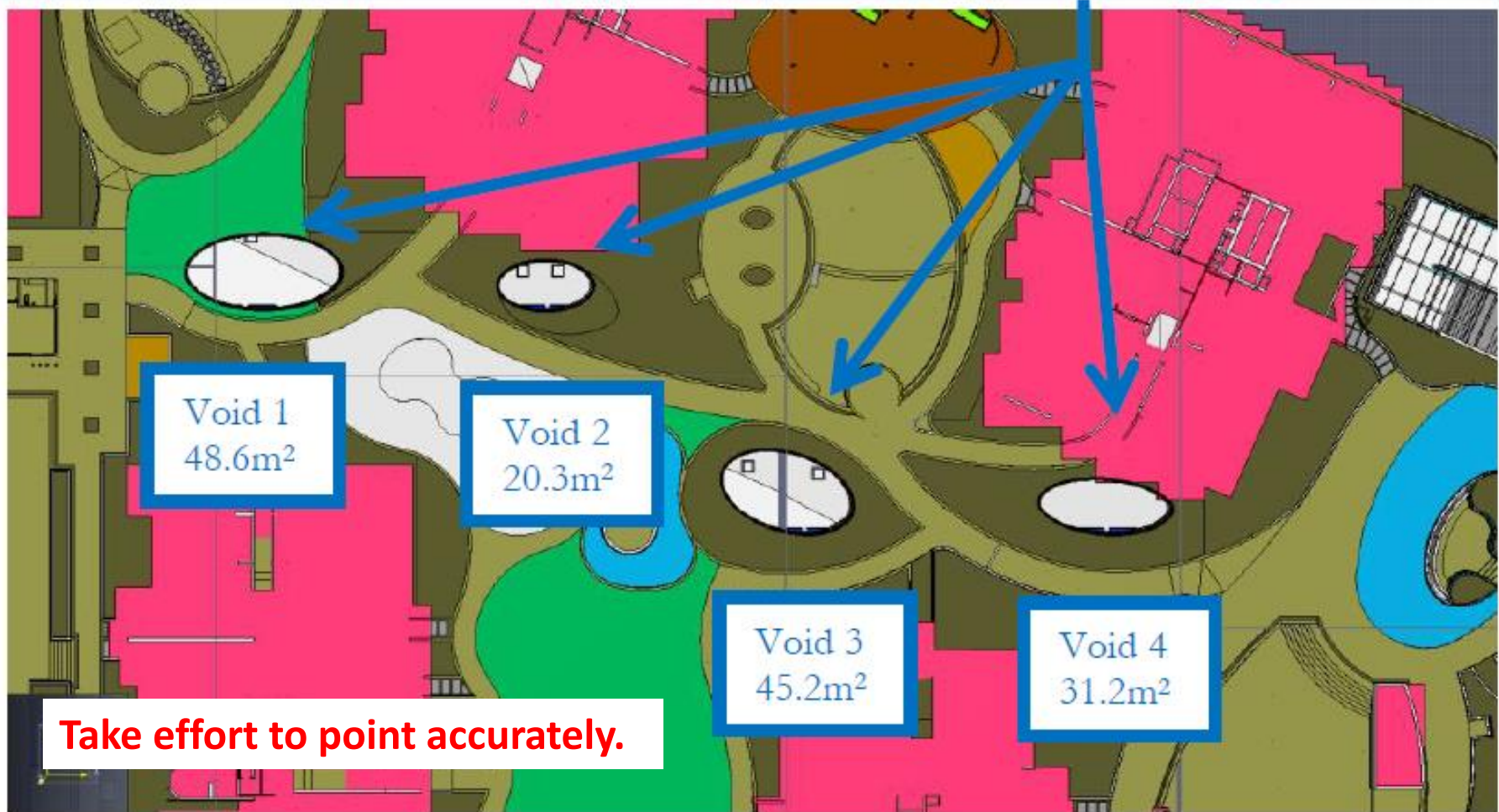


Figure 11: Zoom-in Pyrosim screenshot of voids on roof of L3 residential carpark

LEVEL 6
WAREHOUSE / STAGING AREA
 FLR TO FLR HT: 10.0m
DEVIATIONS & FIRE SCENARIOS

MAKE-UP AIR AT LOW LEVEL
 THROUGH NON-PERFORATED,
 NON-LOCKABLE SHUTTERS
 EFFECTIVE AREA: 140.4m²

EXHAUST AT HIGH LEVEL
 THROUGH SMOKE
 DAMPERS OPENINGS
 EFFECTIVE AREA: 9.5m²

STAIR

MAKE-UP AIR AT LOW LEVEL
 THROUGH LOUVERS
 (SEE WEST ELEVATION)

EXHAUST AT HIGH LEVEL
 THROUGH LOUVERS
 (SEE WEST ELEVATION)

L6 WAREHOUSE
(PB-AREA)
(A&A WORKS)

THE EXISTING
FLOOR, L6 IS
PROTECTED WITH
ESFR FIRE
SPRINKLERS

MAKE-UP AIR AT LOW LEVEL
 THROUGH LOUVERS
 (SEE EAST ELEVATION)

EXHAUST AT HIGH LEVEL
 THROUGH LOUVERS
 (SEE EAST ELEVATION)

D3:
NON-PERFORATED
SHUTTERS INSTEAD OF
PERFORATED SHUTTERS

D2: NV-ESCS
SMOKE
RESERVOIR AREA:
7000m² > 2600m²

FIRE
SCENARIOS
F1=4.3MW
F1S=1.0MW
F1S2=4.3MW

EXISTING APPROVED ASRS
(NO A&A WORKS)

D1: NV-ESCS
SMOKE RESI
LENGTH:
124m > 60m

Information provided MUST be consistent

D2	L6 Warehouse L7 Warehouse	7 – Mechanical Ventilation and Smoke Control Systems	<p>7.6.7(a) - The maximum smoke reservoir area for natural smoke ventilation system is 2,000m².</p> <p>L6 Warehouse – 7000m² (>2000m²) L7 Warehouse – 7000m² (>2000m²)</p>
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ASET Determination



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Determination of ASET- Existing criteria (FSE Dialogue Mar 2018)

1. Taken when first queuing location fails tenability criteria. Could be at :
 - a) Main exit door
 - b) Exit staircase door
 - c) SSL/FFL door
 - d) etc
2. Mark out these egress provisions clearly in CFD results.
3. Show ASET slice in FER.
4. Show closer time steps slightly before/after ASET timing.



Determination of ASET (General Guide)

1. Taken when ~~first queuing~~ **any modelled** location fails tenability criteria (**exclude area in the vicinity of fire**).
Could be at :
 - a) Main exit door
 - b) Exit staircase door
 - c) SSL/FFL door
 - d) **Along ALL egress routes**
2. Mark out these egress provisions clearly in CFD results.
3. Show ASET slice in FER.
4. Show closer time steps slightly before/after ASET timing.

Reason for review:

- **Some egress paths can fail and compromise life safety, even before areas near exits fail the tenability criteria.**
- **Unclear measurement distance from exits**



Determination of ASET (Alternative)

[Exception to apply original ASET criteria (From the Mar 2018 FSE Dialogue)]

1. Taken when first queuing location fails tenability criteria. Could be at:
 - a) Main exit door
 - b) Exit staircase door
 - c) SSL/FFL door
 - d) etc

Exception to apply only under certain conditions as shown in the following page.



Determination of ASET (Alternative)

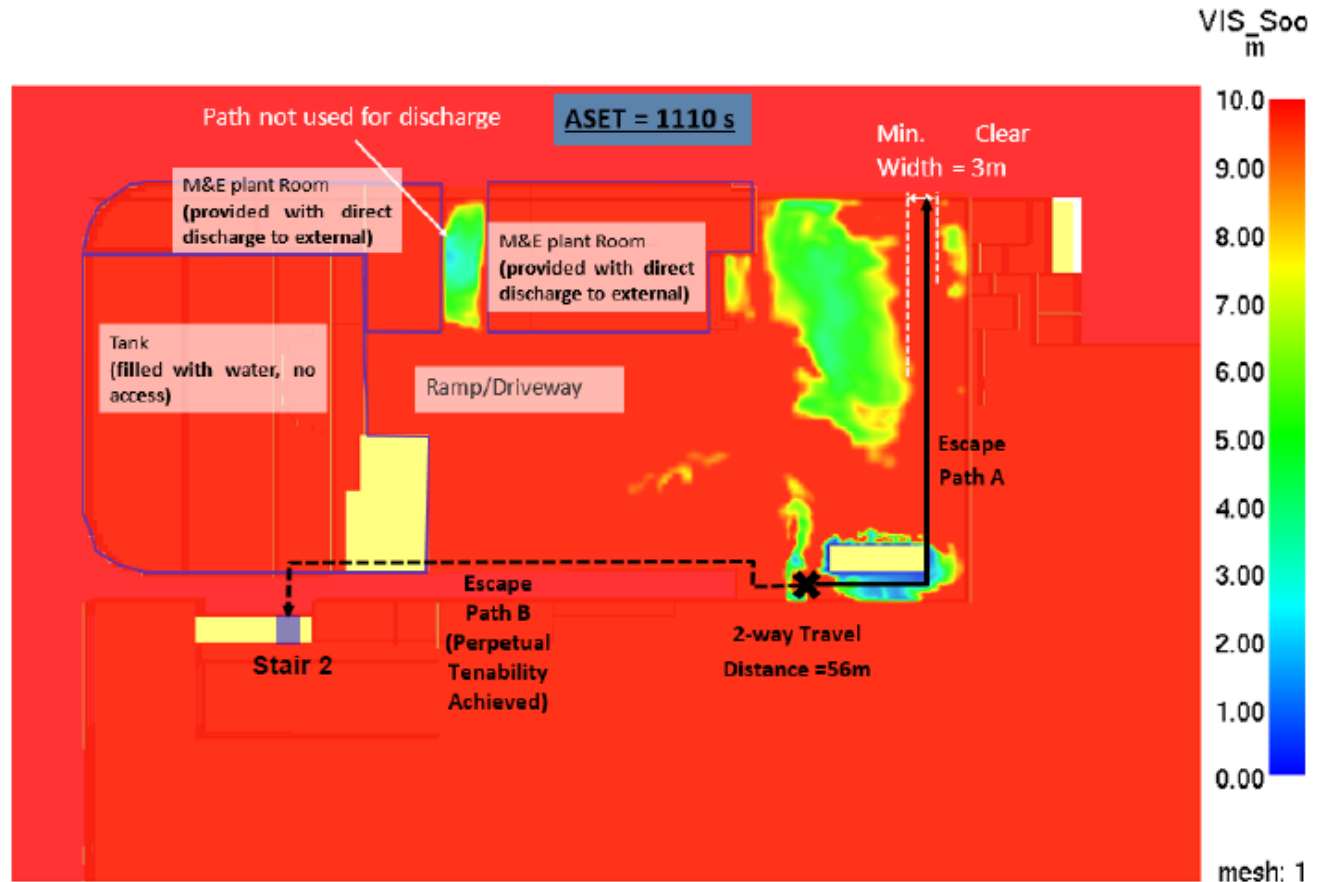
[Exception to apply original ASET criteria (From the Mar 2018 FSE Dialogue)]

Point 1 (previous page) can only apply under ALL of these circumstances:

- Only for PG VI & PG VIII development (Lower life safety risk); and
 - PB area has more than 2 compliant exit staircases that are remotely located; and
 - Deviations do not involve travel distances, discharge or exit capacity; and
 - There are 2 or more available egress paths from any remote location; and
 - Egress paths (at least 3m wide) are available from the seat of fire and they are clearly not obstructed by areas which may compromise occupant safety; and
 - Areas within 5 m from the queuing location shall not have conditions that may compromise occupant safety; and
 - None of the modelled areas shall have any portion that fail the acceptance criteria within the first 3 minutes of the flow/movement time
-
- NOTE: This alternative (Point 1) is a transition measure until further announcement.



Show clearly the egress paths if FSE adopts **alternative** criteria to determine ASET



Frame: 222
Time: 1110.0

Cannot be accepted. FSE did not clearly demarcate egress paths meeting the **alternative** criteria.

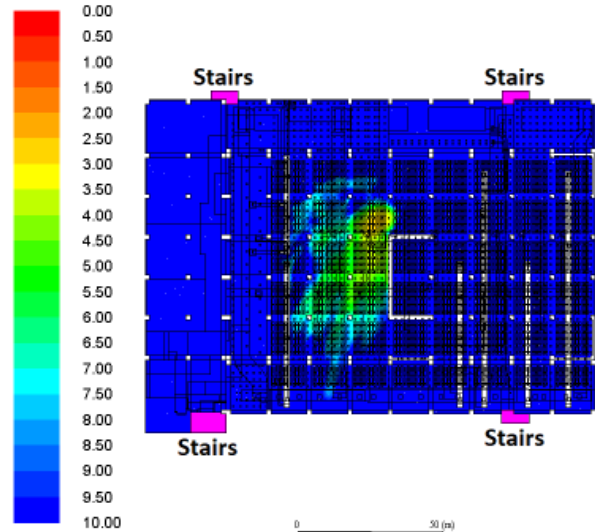


Fig 6.1.1-2e: BC1 Visibility @ 2.5m AFFL of Level 2 (1200secs)

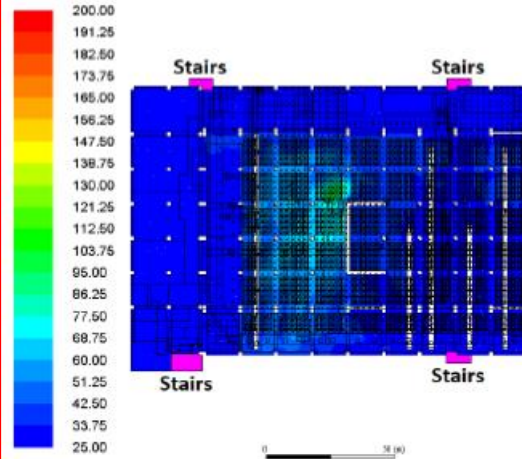


Fig 6.1.1-3k: BC1 Temp. @ 2.5m AFFL of Level 2 (1200secs)

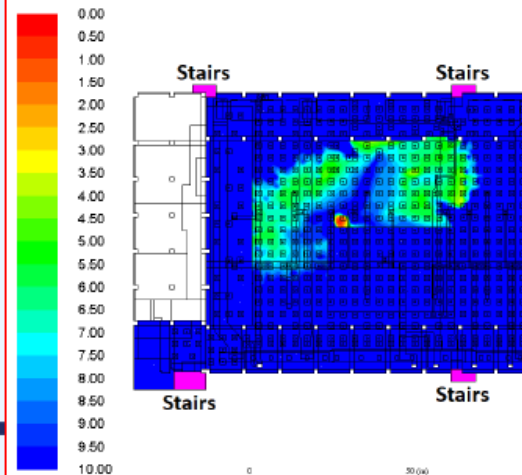


Fig 6.1.5-2f: SS3 Visibility @ 2.5m AFFL of Level 3 (1200secs)

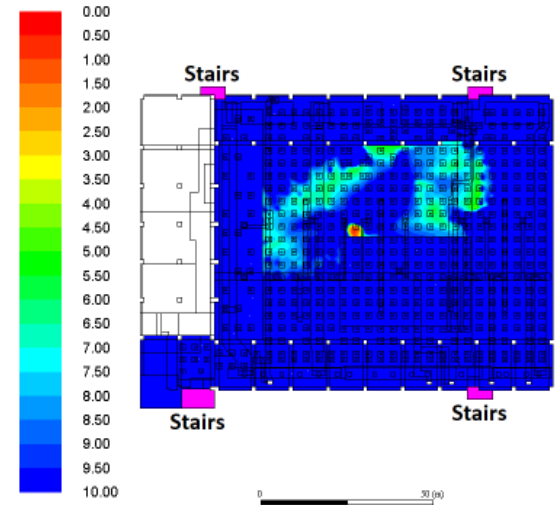


Fig 6.1.4-2e: BC2 Visibility @ 2.5m AFFL of Level 3 (1200secs)

Any Other Business



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FSE Inquiry Comm (FSEIC) convened twice in 2018.

Issues :

1. FER modelled different scenarios from approved FEDB.
(Restricted)
2. Peer reviewer did not highlight issue above. (Restricted)
3. Conflict of interest. (Fined)

Moving fwd, FSEIC details may be shared.



SFEG 2015 to be reviewed.

We would like to hear from you :

1. Feedback
2. Areas for review



Fire Code 2018

Effective 1st Mar 2019

Pay attention to clauses quoted.



Advice for FSEs and Peer Reviewers:

Please review ALL the Fire Safety Act and Fire Safety Regulations, including (and not limited to) those below:

- Fire Safety Act
- Fire Safety (Building and Pipeline Fire Safety) Regulations
- Fire Safety (Exemption) Order
- Fire Safety (Fire Safety Engineers)(Code of Professional Conduct and Ethics) Regulations
- Fire Safety (Fire Safety Engineers) Regulations



Q & A



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Questions:

- I am the Peer Reviewer for a large project and I have already submitted the PR report to the FSE for submission to SCDF. At what point after this can I undertake QP submission for another portion of this large development without conflict of independence (i.e. after SCDF PB audit is cleared OR after TFP) ?
- When will the duties of the Peer Reviewer cease (after PB audit, after TFP, after TOP OR after CSC...) and he is able to take up a consultancy project in the same development?

Answer:

On the surface, FSE's (or his company's/employer's) future appointment as a QP may be seen as a conflict of interest for his current role as a peer reviewer. FSE to seek his own legal counsel on interpreting the relevant sections of the Fire Safety Act.



FSE-CPE = 3 hours

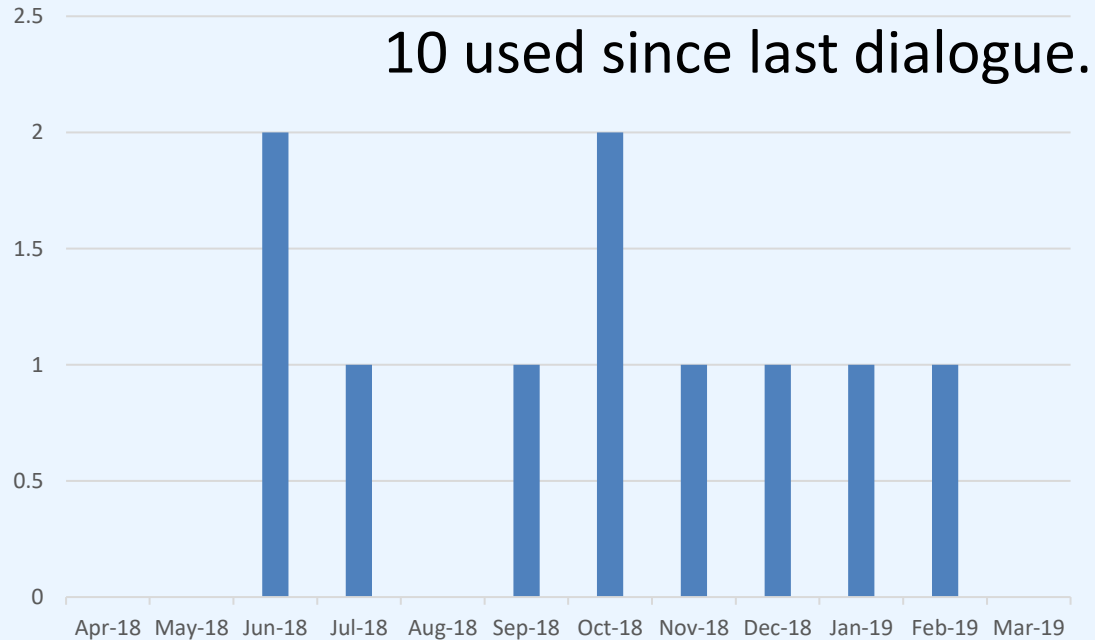
for FSE Dialogue 2019 attendees



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Project Priority Card



Project Priority Card

for FSE Dialogue 2019 attendees



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- ✓ One for each FSE.
- ✓ Valid for one submission only (either FEDB or FER or PB-WVR).
- ✓ Non-transferable. Must be the submission FSE.
- ✓ Valid until next FSE dialogue.
- ✓ Non-Replaceable if you lose/damage it.
- ✓ Physically surrender to Nic/Tong before it can be used.
- ✓ Must be in good condition.
- ✓ Allows priority for ONE
 - Review only; or
 - Presentation only
- ✓ Can be used to borrow VGA adaptor for consultation.



End



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