Annual Fire Safety Engineer (FSE) Dialogue Session

Monday 12th March 2018
2:00 pm to 5:00 pm
SCDF HQ
City Campus Level 3 Lecture Room 1A

Agenda :

2:00 pm to 5:00 pm

- PB Regulatory Systems
  - ✓ FSE Registration
  - ✓ Number of cases
- CPE Progress Update
- Admin Requirements
- Fire Engineering Technical Requirements Update
  - ✓ Mark-up (**Good**, **Bad**, **Ugly**)
- AOB
- QnA

Performance-Based Regulatory System

FSE registration

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

✓ Current FSEs (“Practising” & “Restriction of Practice”) - 77

SCDF
The Life Saving Force
SINGAPORE CIVIL DEFENCE FORCE

Our Ref: CD/FSSD/12/02/03/01

Date : 06 Nov 2017

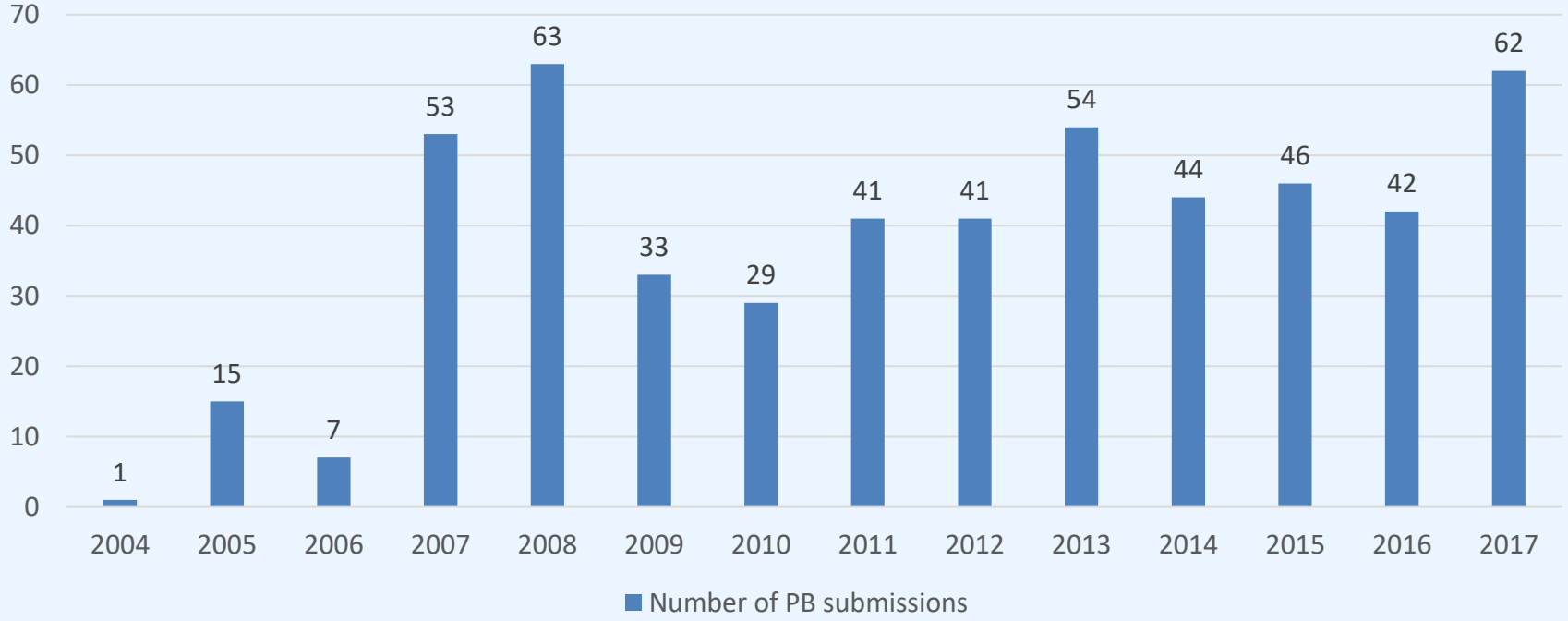
Registrar, Board of Architects
Registrar, Professional Engineers Board
President, Singapore Institute of Architects
President, Institution of Engineers, Singapore
President, Association of Consulting Engineers, Singapore

Dear Sir/Mdm

INVITATION FOR REGISTRATION AS FIRE SAFETY ENGINEER (FSE)

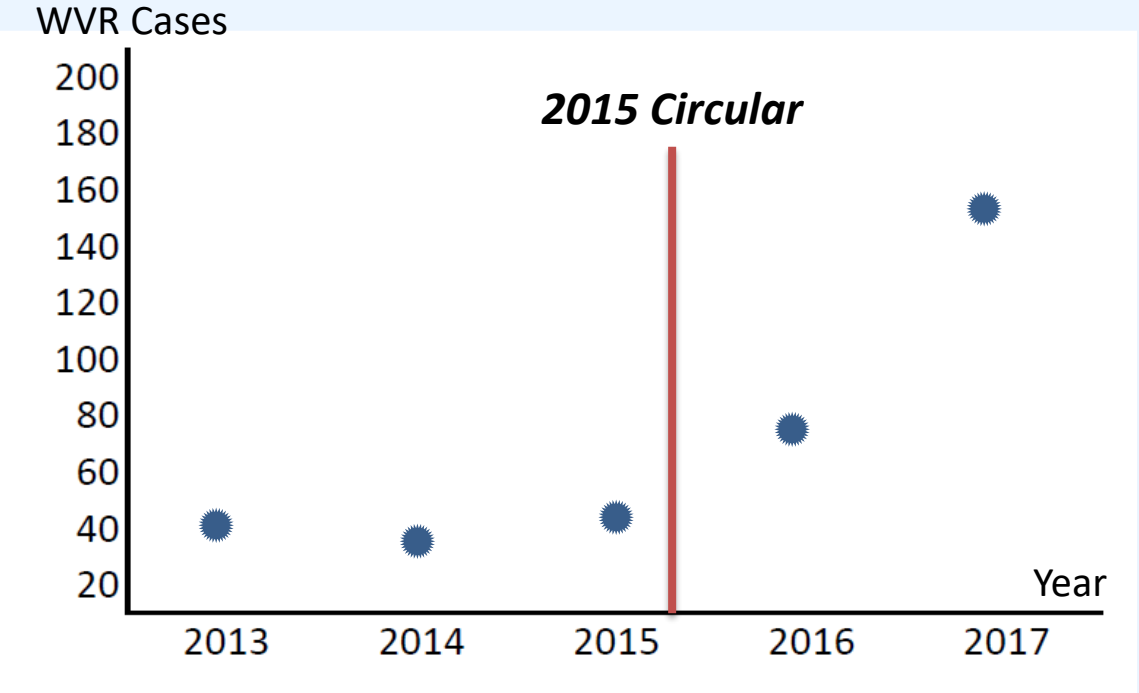
The SCDF has commenced its 14th FSE registration exercise and invites application for registration as FSE. The closing date for this application is on 31 Jan 2018.

Number of PB cases



Number of PB-WVR cases

Year	WVR cases
2013	40
2014	30
2015	45
2016	80
2017	160



Number of PB cases

Upward trend.

REMINDER :

- **We are not here to check your reports for you.**
- **FSE must check all reports before submission.**

Continuing Professional Education Programme (updates)

List of approved courses (Sep 2017 onwards)

www.scdf.gov.sg
>> Fire Safety
>> Fire Safety Approval
>> Performance-Based Approach to Fire Safety Design

S/NO	Approved Course	Date	CPE Hrs
1	VIC Building Materials Compliance Seminar	4-Sep-17	1
2	AS 1670.1 & 1670.4 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 IFE 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	SFPE North America Conference & Expo	10-11 Oct 2017	10
8	SFPE North America Conference & Expo (Post conference course - Application of Fire Risk Assessment)	12-13 Oct 2017	14
9	SFPE 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 AS5113 Façade 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	FiSAC workshop	15-Nov-17	9
14	FiSAC conference	16 to 17 Nov 2017	18
15	Innovative Fire Protection	6-Dec-17	1
16	Victorian Cladding Taskforce	11-Dec-17	1
17	Introductory STEPS Training Course	24 to 25 Jan 2018	13
18	PATHFINDER workshop	19 to 20 Mar 2018	14
19	PYROSIM workshop	22 to 23 Mar 2018	14
20	International Fire Conference & Exhibition Malaysia	27 to 29 Mar 2018	15

Online courses (Max 5 CPE hrs per training cycle)

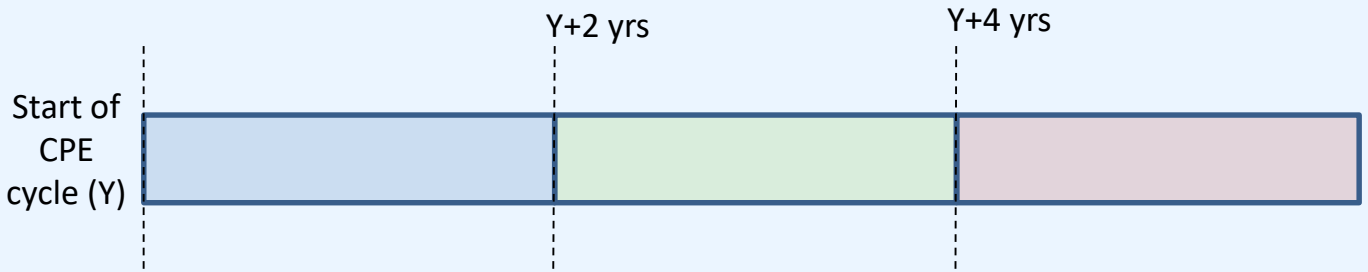
SFPE On-Demand Learning (http://www.sfpe.org/?page=OnDemandLearning)	CPE hrs
Human Behaviour In Fire	4
Introduction for Fire Risk Assessment	2.5
Principles of Fire Protection Engineering	4

Jensen Hughes Academy courses (https://www.jensenhughesacademy.com/core/index.php)	CPE hrs
Smoke control bundle	2

17	Introductory STEPS Training Course	24 to 25 Jan 2018	13
18	PATHFINDER workshop	19 to 20 Mar 2018	14
19	PYROSIM workshop	22 to 23 Mar 2018	14
20	International Fire Conference & Exhibition Malaysia	27 to 29 Mar 2018	15

CPE Programme

- 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



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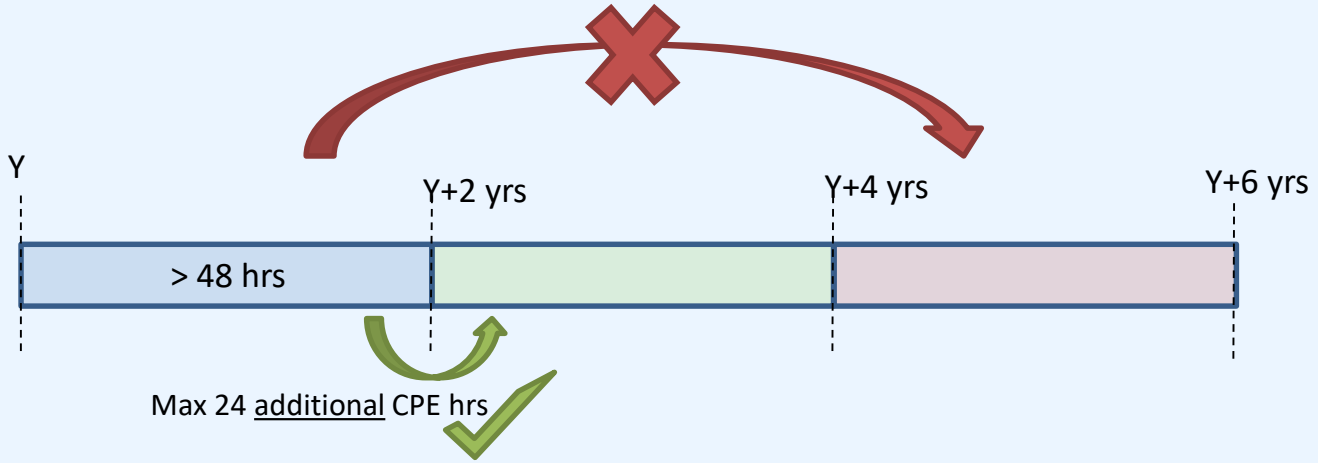
Carry over of CPE hours (Example)



- 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

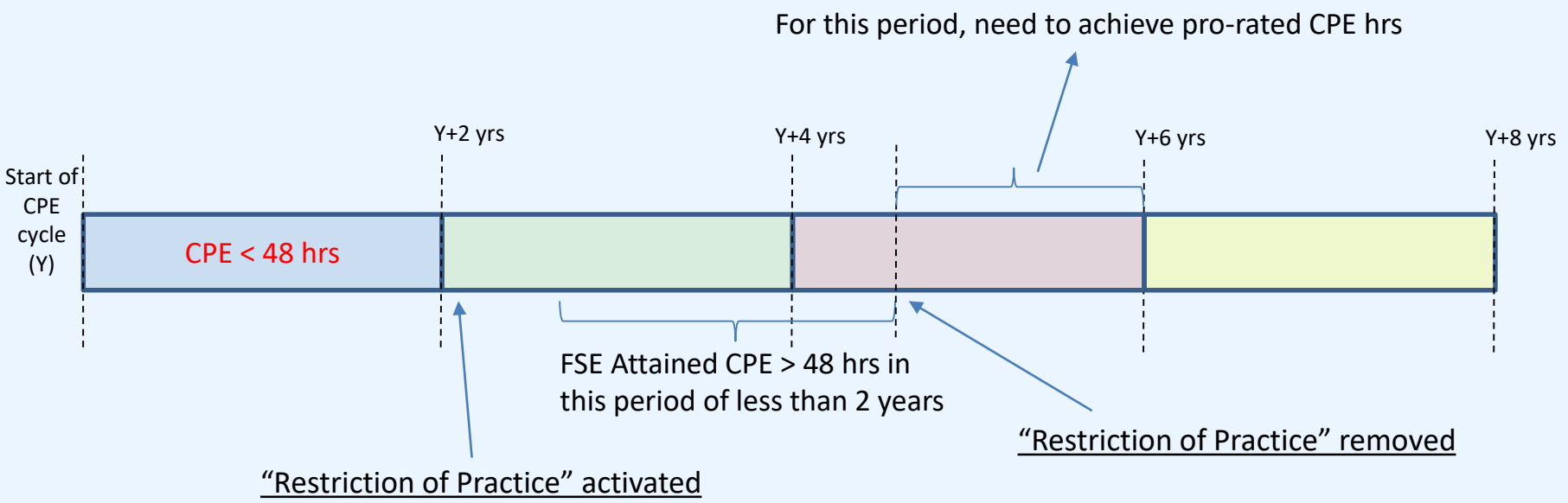
Failure to meet CPE requirements

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


For this period, need to achieve pro-rated CPE hrs
Y+2 yrs
Y+4 yrs
Y+6 yrs
Y+8 yrs
Start of CPE cycle (Y)
CPE < 48 hrs
FSE Attained CPE > 48 hrs in this period of less than 2 years
"Restriction of Practice" removed
"Restriction of Practice" activated

Reinstatement of practising status

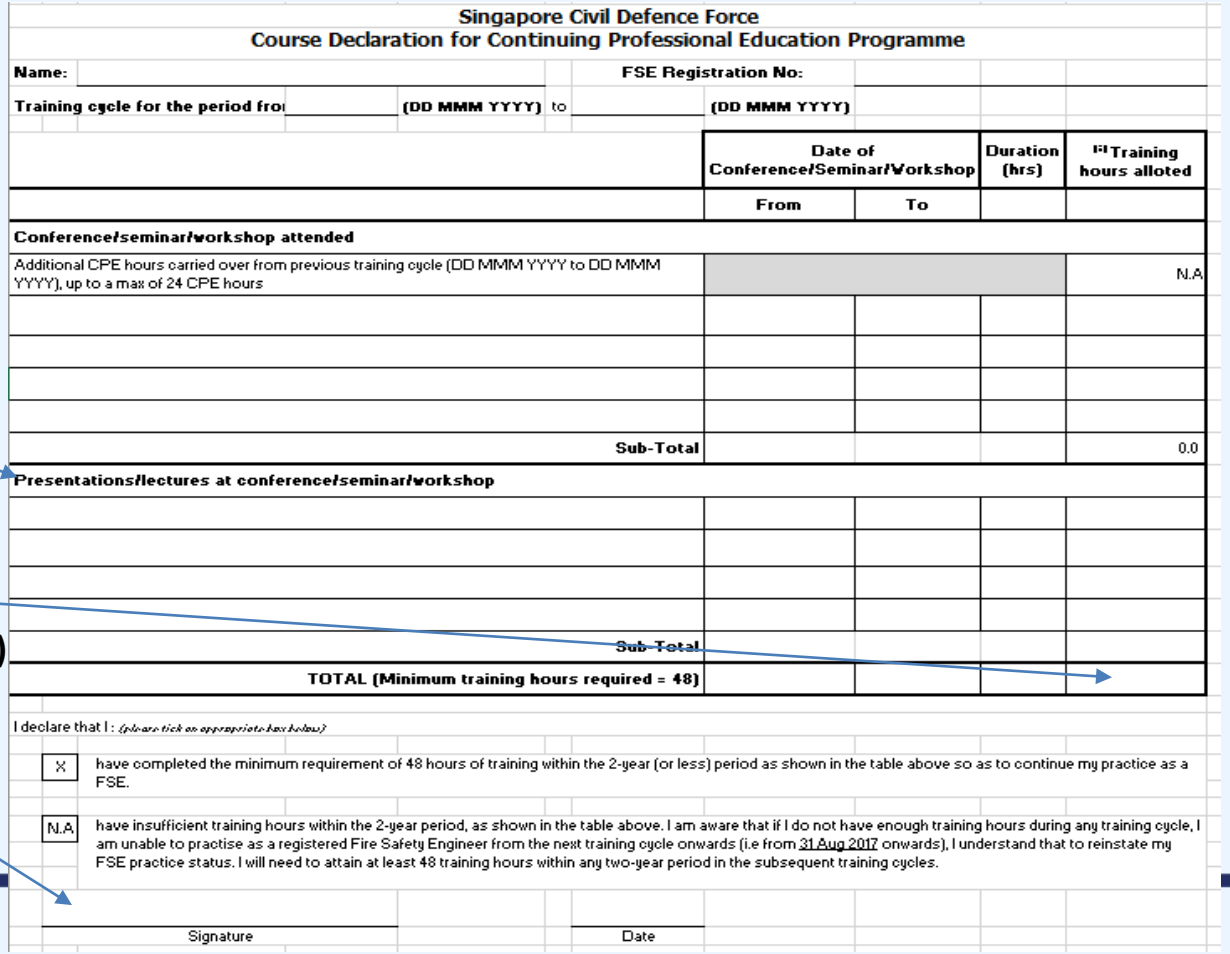
2-year period

No carry forward

Ensure approval from SCDF (for the presentations/lectures to be awarded CPE hours) is obtained prior to the event

Ensure 48 hours or more (extra hours NOT carried forward)

Sign and submit in PDF format



Singapore Civil Defence Force
Course Declaration for Continuing Professional Education Programme

Name: _____ **FSE Registration No:** _____

Training cycle for the period fro _____ **(DD MMM YYYY)** to _____ **(DD MMM YYYY)**

	Date of Conference/Seminar/Workshop		Duration (hrs)	[#] Training hours alloted
	From	**To**		
Conference/seminar/workshop attended				
Additional CPE hours carried over from previous training cycle (DD MMM YYYY to DD MMM YYYY), up to a max of 24 CPE hours				N.A
Sub-Total				0.0
Presentations/lectures at conference/seminar/workshop				
Sub-Total				
TOTAL (Minimum training hours required = 48)				

I declare that I : *(please tick as appropriate box below)*

X — have completed the minimum requirement of 48 hours of training within the 2-year (or less) period as shown in the table above so as to continue my practice as a FSE.

N.A — have insufficient training hours within the 2-year period, as shown in the table above. I am aware that if I do not have enough training hours during any training cycle, I am unable to practise as a registered Fire Safety Engineer from the next training cycle onwards (i.e from 31 Aug 2017 onwards). I understand that to reinstate my FSE practice status. I will need to attain at least 48 training hours within any two-year period in the subsequent training cycles.

_____ Signature

_____ Date

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CPE declaration at end of training cycle

Ensure the time period aligns with your training cycle (or the prorated duration if recently reinstated)

May include carry forward from immediate previous training cycle

Ensure approval from SCDF (for the presentations/lectures to be awarded CPE hours) is obtained prior to the event

Ensure:
- 48 CPE hours or more, or
- exceed the pro-rated CPE hours for recently reinstated FSEs)

Sign and submit in PDF format

FORM FSSD-CPD1

Singapore Civil Defence Force
Course Declaration for Continuing Professional Education Programme

Name: _____ **FSE Registration No:** _____

Training cycle for the period fro _____ **(DD MMM YYYY)** to _____ **(DD MMM YYYY)**

	Date of Conference/Seminar/Workshop		Duration (hrs)	[#] Training hours alloted
	From	To		
Conference/seminar/workshop attended				
Additional CPE hours carried over from previous training cycle (DD MMM YYYY to DD MMM YYYY), up to a max of 24 CPE hours				
Sub-Total				0.0
Presentations/lectures at conference/seminar/workshop				
Sub-Total				
TOTAL (Minimum training hours required = 48)				

I declare that I : *(please tick as appropriate box below)*

☐ have completed the minimum requirement of 48 hours of training within the 2-year period as shown in the table above so as to continue my practice as a FSE.

☐ have insufficient training hours within the 2-year period, as shown in the table above. I am aware that if I do not have enough training hours during any training cycle, I am unable to practise as a registered Fire Safety Engineer from the next training cycle onwards (i.e from 31 Aug 2017 onwards), I understand that to reinstate my FSE practice status. I will need to attain at least 48 training hours within any two-year period in the subsequent training cycles.

_____ Signature

_____ Date

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www.scdf.gov.sg
>> Fire Safety
>> Fire Safety Approval
>> Performance-Based Approach to Fire Safety Design

The performance-based regulatory system was officially launched on 1 July 2004.

- Registration for Fire Safety Engineers
- List of Projects involving Performance-Based Fire Safety Design
- List of approved CPE courses
- Fire Safety Engineering (FSE) Dialogue Session
- Register of Fire Safety Engineers
- Performance-Based Plan Approval Process
- Roles & Responsibilities
- Performance-Based Provisions
- Performance-Based Provisions Code Structure
- Frequently Asked Questions
- Circulars on Performance-Based Fire Safety Issues

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- **Searchable format**
- **Postal Code added**

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- Performance-Based Provisions Code Structure
- Frequently Asked Questions
- Circulars on Performance-Based Fire Safety Issues

List of Performance-Based Fire Engineering Projects

Reference number	Registration date	Title	Postal Code
FEDB/001061/04	15/7/2004	APPLICATION FOR IN-PRINCIPLE AGREEMENT OF FIRE SAFETY ENGINNERING BRIEF - FOR THE FIRE ENGINEERING ANALYSIS ON THE USE OF ALPOLIC/FR 30% PERFORATION PANELS AT THE BOTTOM OF THE ROOF TRUSS (BELOW THE CEILING) IN TERMINAL 3S DEPARTURE HALL	819663
FEDB/001100/04	17/11/2004	PROPOSED ERECTION OF SINGLE STOREY EXHIBITION HALL HALL 7 TO 10 FOR SINGAPORE EXPO EXPANSION ON LOTS 09788T PT(SL) 07360L PT(SL) 09566A PT(SL)07361C PT(SL) 98328L(SL)MK 27 AT EXPO DRIVE/UPPER CHANGI ROAD EAST/CHANGI SOUTH AVENUE 1	
FEDB/001120/05	7/1/2005	PROPOSED ERECTION OF PART SINGLE STOREY/PART 2-STOREY, SOUTHERN TRABSPORT TRANSIT COMPLEX WITH BASEMENT CAOMPRISING OF CARPARKS MONORAIL STATION AND DEPOT BUILDING ON LOT 254PT(SL), 451PT(SL), 497PT(SL), 589PT(SL) MK 34 PALAWAN BEACH, SENTOSA (SOUTHERN ISLANDS PLANNING AREA)	
FEDB/001160/05	24/1/2005	PROPOSED ADDITIONS & ALTERATIONS TO BLOCK A, B, C, D AND CANOPY OVER THE INTERNAL STREETS ON LOT 152 155 158 159 161 AND STATE LAND LOTS 275PT 273PT 273PT[SLRD] 274PT 276PT AND 277PT TS 09 AT CLARKE QUAY (CONSERVATION AREA) RIVER VALLEY ROAD SINGAPORE	
FEDB/001200/05	21/2/2005	PROPOSED EXTENSION WITH ALTERATIONS AND ADDITIONS TO EXISTING SINGLE-STOREY GROCERY WAREHOUSE WITH 3-STOREY ANCILLARY OFFICE ON LOT 2292K MK 7 AT NO. 37 JOO KOON CIRCLE (JURONG INDUSTRIAL ESTATE - PIONEER PLANNING DGP)	629062
FEDB/001220/05	31/3/2005	PROPOSED CARPARK VENTILATION SYSTEM TO THE PROPOSED CONDOMINIUM DEVELOPMENT COMPRISING 7 BLOCKS OF 10-STOREY APARTMENTS (TOTAL: 318 UNITS) WITH BASEMENT CARPARK, 3 SWIMMING POOLS AND ANCILLARY FACILITIES ON LOTS 2070, 2072PT MK 16 AT DUNEARN ROAD (BUKIT TIMAH PLANNING AREA)	
FEDB/001260/05	22/4/2005	PROPOSED CARPARK MECHANICAL VENTILATION SYSTEM (USING DIRECT AXIAL FANS) TO PROPOSED ERECTION OF 15 BLOCKS OF 6-STOREY W/ATTIC CONDOMINIUM HOUSING DEVELOPMENT (TOTAL 200 UNITS) WITH BASEMENT CARPARK AND SWIMMING ON LOT 1392M MK 34 AT OCEAN DRIVE	
FEDB/001280/05	10/6/2005	PROPOSED ERECTION OF A 5-STOREY SINGLE-USER WAREHOUSE WITH A 9-STOREY ANCILLARY OFFICE ANNEXE ON LOT 7994X PT (JTC PLOT A0524401) MK 5 AT PENJURU LANE	609206
FEDB/001300/05	24/6/2005	PROPOSED MINI JET FANS DUCTLESS CARPARK VENTILATION SYSTEM TO PROPOSED RESIDENTIAL DEVELOPMENT COMPRISING THE ERECTION OF 1 BLOCK OF 7 STOREY APARTMENT AT UPPER BUKIT TIMAH ROAD	678185
FEDB/001301/05	24/6/2005	PROPOSED MINI JET FANS DUCTLESS CARPARK MECHANICAL VENTILATION SYSTEM TO PROPOSED MIXED COMMERCIAL DEVELOPMENT COMPRISING 1 BLOCK OF 25-STOREY OFFICE TOWER WITH ELEVATED CAR PARKS 1 BLOCK OF 12-STOREY SOHO TOWER 1 BLOCK OF 8-STOREY SOHO TOWER WITH CIVIC & COMMUNITY INSTITUTION ON 3RD & 4TH STOREY AND A 4-STOREY RETAIL CUM F & B PODIUM WITH 1 BASEMENT ON URA PARCEL 594 TS 07 AT EU TONG SENG STREET/TEW CHEW STREET	059817
FEDB/001320/05	24/6/2005	PROPOSED MINI JET FANS DUCTLESS CARPARK MECHANICAL VENTILATION SYSTEM TO PROPOSED AMENDMENT TO APPROVE CONDOMINIUM HOUSING DEVELOPMENT COMPRISING 5 BLOCK OF 8 STOREY APARTMENTS(TOTAL 295 UNITS) WITH COMMON BASEMENT AND COMMUNAL FACILITIES AT MOUNT EMILY ROAD	228406
FEDB/001340/05	8/9/2005	PROPOSED DUCTLESS JET FANS SYSTEM FOR MECHANICAL VENTILATION & SMOKE PURGING FOR CARPARK TO PROPOSED CONDOMINIUM HOUSING DEVELOPMENT COMPRISING 12 BLOCKS OF 17-STOREY RESIDENTIAL BUILDINGS WITH BASEMENT CARPARK, TENNIS COURTS, SWIMMING POOL, CLUBHOUSE AND COMMUNAL FACILITIES ON LOT 8988K, MUKIM 22 (URA LAND PARCEL) AT KOVAN ROAD/FLOWER ROAD (HOUGANG PLANNING AREA)	
FEDB/001380/05	3/10/2005	PROPOSED ERECTION OF A 8-STOREY SINGLE-USER LIGHT INDUSTRIAL DEVELOPMENT (LOGISTICS HUB) ON LOT 4201N PT (JTC PLOT A1997000) MK 31 AT ALPS AVENUE	
[illegible]	[illegible]	PROPOSED ERECTION OF A 4-STOREY SINGLE-USER LIGHT INDUSTRIAL DEVELOPMENT (LOGISTICS	

File | Message | Tell me what you want to do...

Ignore | Junk | Delete | Reply | Reply All | Forward | Meeting | More | Delete | Respond

HFAD matters | Team Email | Reply & Delete | To Manager | Done | Create New | Quick Steps

Move | Rules | OneNote | Actions | Move

Mark Unread | Categorize | Follow Up | Tags

Translate | Find | Related | Select | Editing

Zoom | Zoom

Mon 5/2/2018 5:59 PM

Hong Haey TONG (SCDF)

Approved CPE course - PATHFINDER & PYROSIM workshops March 2018

To

Bcc

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	20180319-23 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

Fire Engineering Technical Requirements Update

FSEs, please check your submission.

1. Accuracy (Numerical or otherwise).
2. Spelling.
3. Diagrams and references
4. Correct case reference numbers
5. Etc, etc…

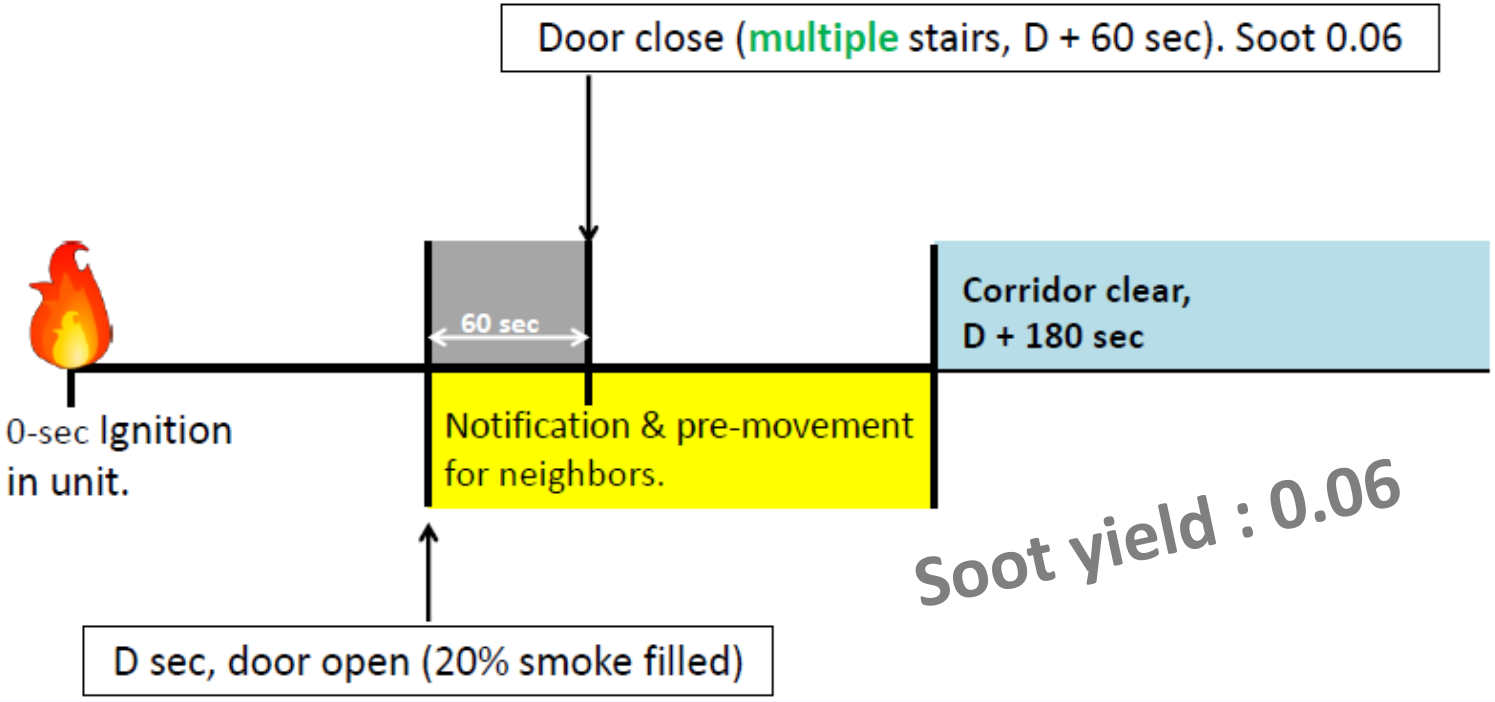
Soot Yield

1. Adopt 0.1 (SFEG) or
2. Justify based on sprinkler design
    a) Hazard category
    b) Highest value
    c) Add 20% safety factor
    d) Discuss in separate section in FER

Acceptance Criteria for residential corridors.

180 seconds after door opens, at the height of Z = 2m:

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



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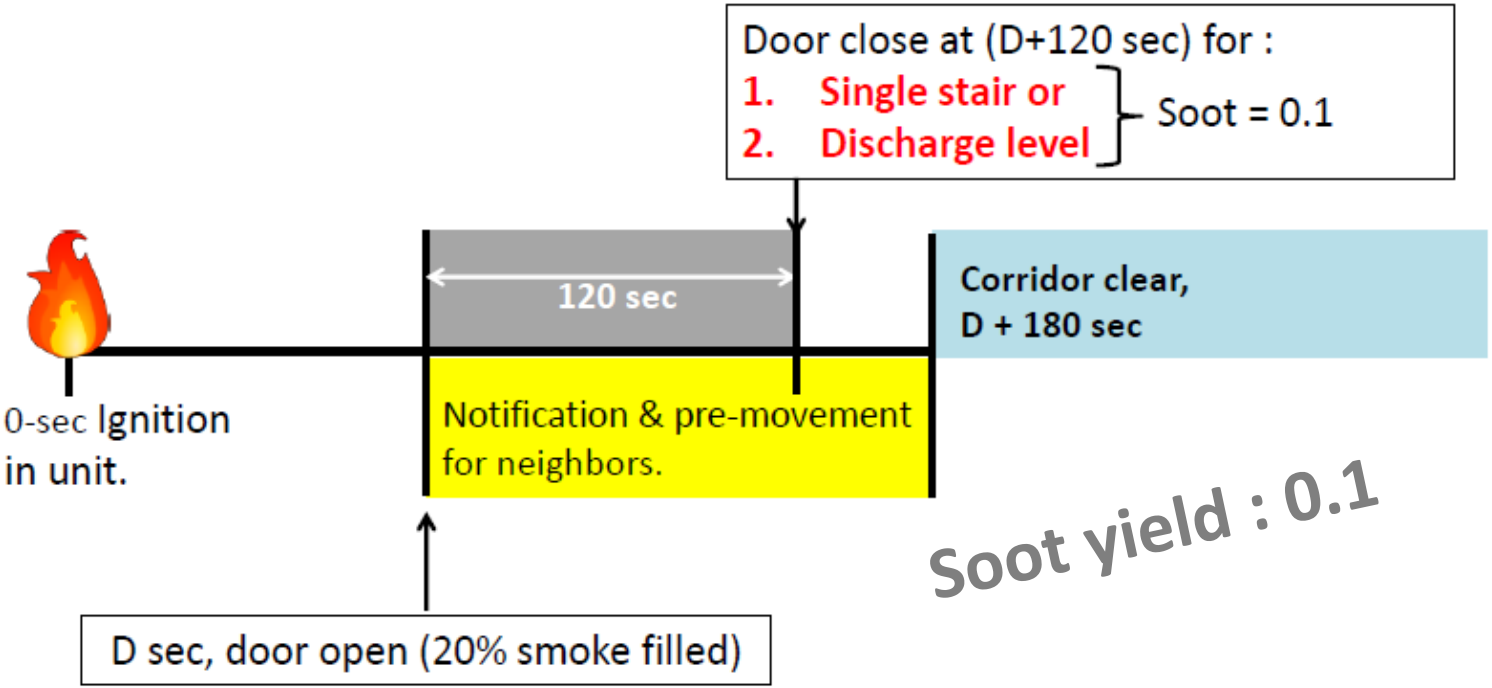


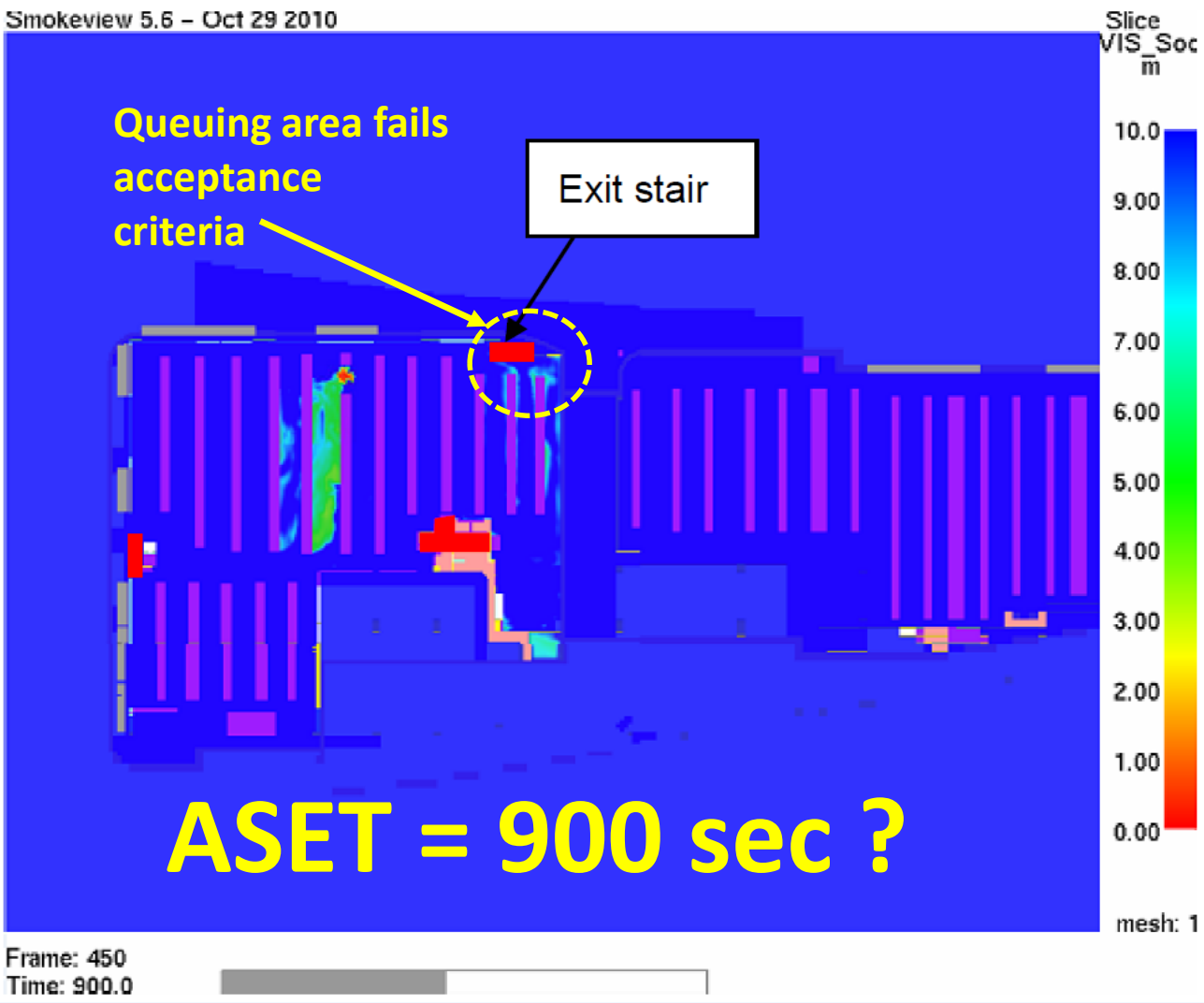
Resi WVR Applications :

Conditional Acceptance if WVR (with FER) is approved :

*CONDITION: To install Home Fire Alarm Devices (**HFAD**) for all homes in this block. HFAD specifications and installation requirements shall follow SCDF circular dated 16 Nov 2017.*

ASET

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


Smokeview 5.6 – Oct 29 2010
Slice
VIS_Soc
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10.0
9.00
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
mesh: 1
Queuing area fails acceptance criteria
Exit stair
ASET = 900 sec ?
Frame: 450
Time: 900.0

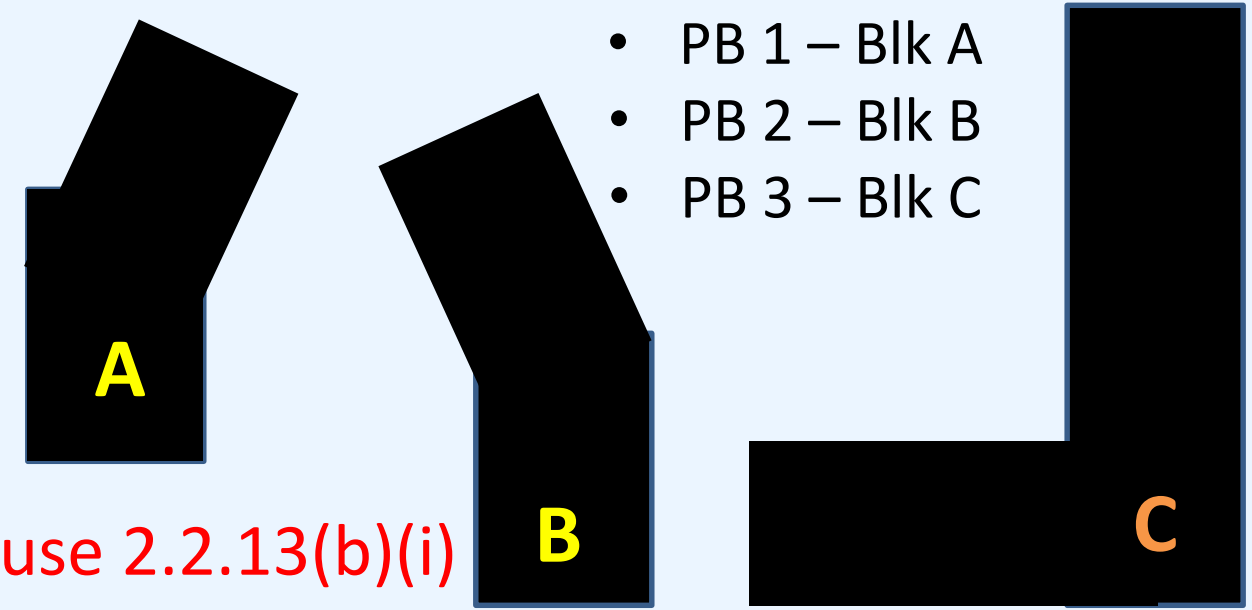
ASET

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 so that SCDF can agree/disagree with ASET timing adopted.

PB Administrative Requirements (Submission for waiver with fire engineering study)

One PB clause, three issues (3 blocks):

- PB 1 – Blk A
- PB 2 – Blk B
- PB 3 – Blk C



Clause 2.2.13(b)(i)

Clause 2.2.13(b)(i)

One clause, Three issues:

- PB 1 – Blk A
- PB 2 – Blk B
- PB 3 – Blk C

WVR/00001/18 **FER**

- PB 1
- PB 2
- PB 3

WVR/00001/18
- PB 1

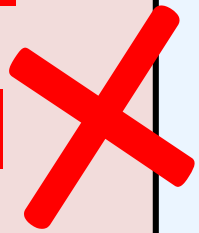
FER

WVR/00002/18
- PB2

FER

WVR/00003/18
- PB 3

FER



Will be REJECTED

WVR/00001/18
- PB for Blks A, B & C
  Clause 2.2.13(b)(i)

FER

Will be REJECTED

Clause 2.2.13(b)(i)

One clause, Three issues:

- PB 1 – Blk A
- PB 2 – Blk B
- PB 3 – Blk C

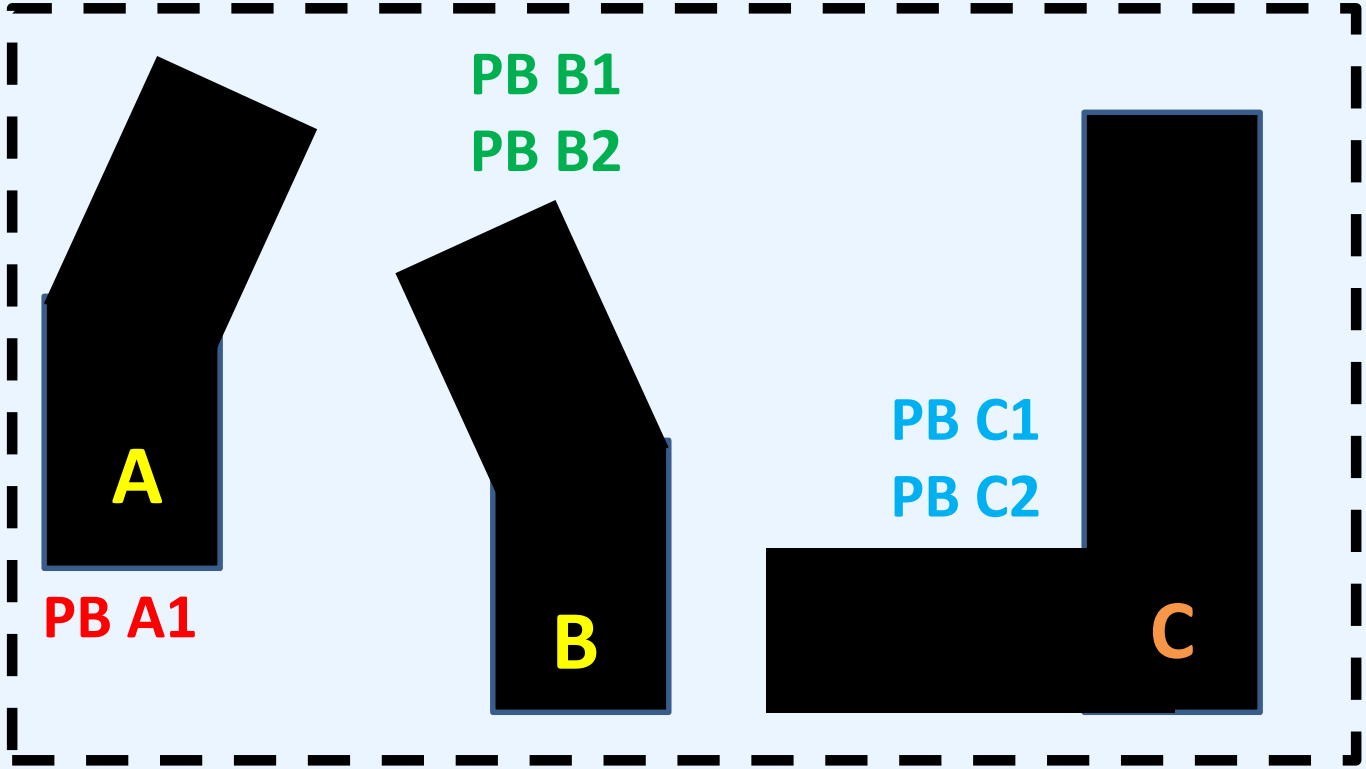
WVR/00001/18 **FER**

- PB 1
- PB 2
- PB 3

Every block/issue requires waiver application, regardless of whether blocks are identical or not. This is because:

1. **Each block should have their own identity**
2. **There could be difference in discharge conditions**
3. **There could be other factors that affect the study (different airwell size)**
4. **There must be a means to approve and reject some identical blocks (if there is a need to)**
5. **Sometimes, it may appear identical to FSEs, but it may not appear identical to SCDF**

Multiple blocks (regardless of whether blocks are identical or not) with multiple PB issues



WVR/00001/18 **FER**

- PB A1
- PB B1
- PB B2
- PB C1
- PB C2

WVR/00001/18 **FER**

- PB A1, B1, B2, C1, C2

Will be REJECTED

WVR/00001/18 **FER**

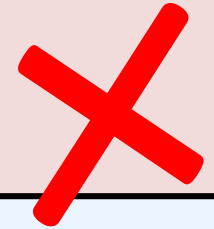
- PB A1
- PB B1
- PB B2
- PB C1
- PB C2

WVR/00001/18 **FER**
- PB A1

WVR/00002/18 **FER**
- PB B1, PB B2

WVR/00003/18 **FER**
- PB C1

WVR/00004/18
- PB C2



Will be REJECTED

WVR/00001/18 **FER**

- PB A1
- PB B1
- PB B2
- PB C1
- PB C2

WVR/00001/18 **FER**

- PB A1
- PB B1, PB B2
- PB C1, PB C2

Deviations are not to be submitted solely by "per block".
Check number of deviations in each block before submission.

Will be REJECTED

Building with multiple fire safety non-compliances

Prescriptive 2

Prescriptive 1

Prescriptive 3

PB 4

PB 3

PB 1

PB 2

Prescriptive 5

Prescriptive 4

Building with multiple fire safety non-compliances

WVR/00001/18 **FER** **Will be REJECTED**

- PB 1
- PB 2
- PB 3
- PB 4

- Prescriptive 1
- Prescriptive 2
- Prescriptive 3
- Prescriptive 4
- Prescriptive 5

Building with multiple fire safety non-compliances

WVR/00001/18 **FER**
- PB 1

WVR/00002/18 **FER**
- PB 2

WVR/00003/18 **FER**
- PB 3

WVR/00004/18 **FER**
- PB 4

Will be REJECTED

WVR/00005/18
- **Prescriptive**

WVR/00006/18
- **Prescriptive** 2

WVR/00007/18
- **Prescriptive** 3

WVR/00008/18
- **Prescriptive** 4

WVR/00009/18
- **Prescriptive** 5

Building with multiple fire safety non-compliances

WVR/00001/18 FER

- PB 1
- PB 2
- PB 3
- PB 4

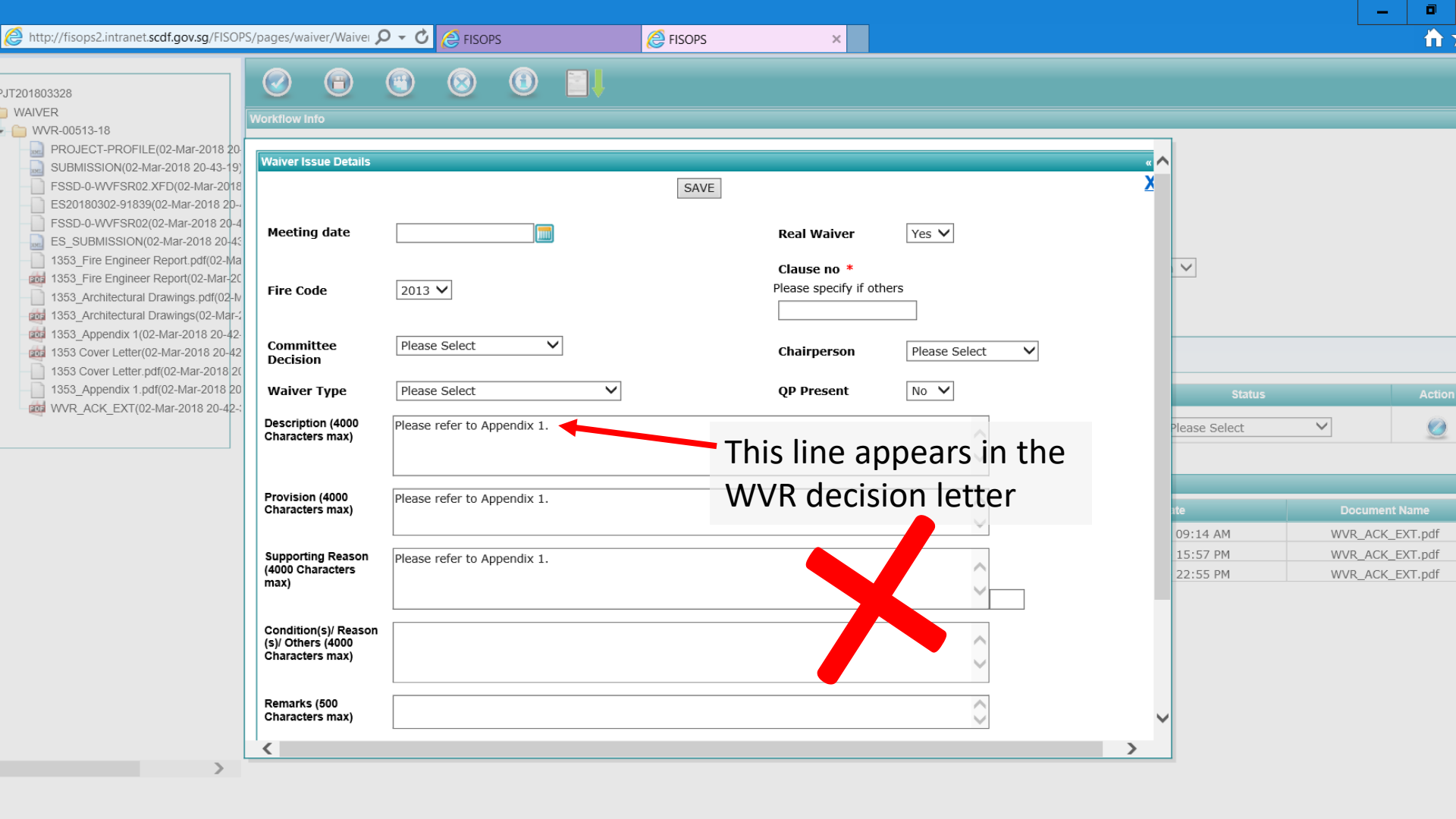
WVR/00002/18

- Prescriptive 1
- Prescriptive 2
- Prescriptive 3
- Prescriptive 4
- Prescriptive 5

PB Administrative Requirements (Clarity of submission for WVR)

Building/Development with multiple PB issues/areas

- All deviations to be clearly written. Which clause for which block/floor/area. Do not refer to Appendices. **Else REJECT**


http://fisops2.intranet.scdf.gov.sg/FISOPS/pages/waiver/Waive
FISOPS
FISOPS
PJT201803328
WAIVER
WVR-00513-18
PROJECT-PROFILE(02-Mar-2018 20
SUBMISSION(02-Mar-2018 20-43-19)
FSSD-0-WVFSR02.XFD(02-Mar-2018
ES20180302-91839(02-Mar-2018 20-
FSSD-0-WVFSR02(02-Mar-2018 20-4
ES_SUBMISSION(02-Mar-2018 20-43
1353_Fire Engineer Report.pdf(02-Ma
1353_Fire Engineer Report(02-Mar-20
1353_Architectural Drawings.pdf(02-M
1353_Architectural Drawings(02-Mar-2
1353_Appendix 1(02-Mar-2018 20-42-
1353 Cover Letter(02-Mar-2018 20-42
1353 Cover Letter.pdf(02-Mar-2018 20
1353_Appendix 1.pdf(02-Mar-2018 20
WVR_ACK_EXT(02-Mar-2018 20-42-
Workflow Info
Waiver Issue Details
SAVE
Meeting date
Fire Code
2013
Committee Decision
Please Select
Waiver Type
Please Select
Description (4000 Characters max)
Please refer to Appendix 1.
Provision (4000 Characters max)
Please refer to Appendix 1.
Supporting Reason (4000 Characters max)
Please refer to Appendix 1.
Condition(s)/ Reason (s)/ Others (4000 Characters max)
Remarks (500 Characters max)
Real Waiver
Yes
Clause no *
Please specify if others
Chairperson
Please Select
QP Present
No
This line appears in the WVR decision letter
Status
Action
Please Select
Document Name
09:14 AM
WVR_ACK_EXT.pdf
15:57 PM
WVR_ACK_EXT.pdf
22:55 PM
WVR_ACK_EXT.pdf

Building/Development with multiple PB issues/areas

- All deviations to be clearly written. Which clause for which block/floor/area. Do not refer to Appendices. **Else REJECT**
- Be mindful not to simply quote the clause. [Eg : 2.2.13 (b)(iii)] but highlight the deviation.

*Clause 2.2.13 (b)(iii) : permanently fixed ventilation openings of area not less than **15 per cent** of the floor area of the lobby and located not more than **9m** from any part of the lobby, opening to an open air well which is open vertically to the sky for its full height. The air-well size shall be in accordance with Cl.2.2.13(a)(iii) except for building not more than 4-storey, in which the air-well shall have a horizontal plan **area** of not less than 10m² or 0.1m² for each 300mm of height of the building, whichever is the greater. The minimum width of such air-well space shall not be less than **3000mm**. The enclosure walls to the air well shall have a minimum **fire resistance of 1 hour** and have no openings other than ventilation openings for the smoke-stop lobby, exit staircase and toilets, or*

Building/Development with multiple PB issues/areas

- Deviations indicated in WVR submissions (CORENET or manual) must match/correspond exactly to that stated in fire engineering reports **(No additional clauses, no shortage of clauses)**. **Else REJECTED**
- Advise your QP well. Every deviation for every block needs a WVR application.

  Eg : 5 identical blocks with 2 deviations each requires 10 WVR applications.

Building/Development with multiple PB issues/areas

- ***Rejection : Submission is not in compliance to guidelines given to FSE on 12/3/18.***

PB Administrative Requirements
(Clearing up of current WVRs)

One WVR Ref No.

7 issues

Separate issues for same block (Block 9)

1 FER, not 7

Blocks 1, 2, 4 & 5 should be separate waiver submissions.

There should be 10 waiver applications, not 7.

Issue 1 needs to be regularised by QP.

Submit and generate a new WVR Ref number for the 3 outstanding issues. (Blocks 2, 4 & 5)

QP needs to update issue 1 in original waiver.

PB Administrative Requirements (PB Presentations)

What is shown during PB presentation:

- Title (Description)
- Introduce the building (Building plans)
- **Table & Drawing** of Deviations
- **Table & Drawing** of Design fire scenarios

REJECTED if missing

  - ✓ **Tabulate** even for singular deviation or design fire scenario
- Mark-up drawings
- Analysis and results

Applies to all **FEDB/FER/WVR Rpts**

What is shown during PB presentation:

- Deviations (Table)
  - ✓ Insert **extent** where applicable.
  - ✓ Highlight key **numbers**.

What is shown during PB presentation:

- Design fire scenarios (Table)
  - ✓ Name all scenarios (FS1, BC1, SS1a,)
  - ✓ Include soot yield in a column **REJECTED if missing**
  - ✓ Remark the Sens Study (What has changed).
    - Fire size up 20%
    - Vent closed

What is shown during PB presentation:

- Mark-up drawings – General principals
  - ✓ Large font. What is important must be large.
  - ✓ Deviations vis-a-vis design fires.
  - ✓ Height - Must be shown on all plans and spelt out in full : “HEIGHT”.

What is shown during PB presentation:

- Mark-up drawings – General principals
  - ✓ Pt form/abbreviations gd (Smk res, Sprk, Elev, UF, etc)
  - ✓ Colours must make sense and have contrast
  - ✓ One zoom-in (or no zoom)
  - ✓ No legends

Help us to help you.

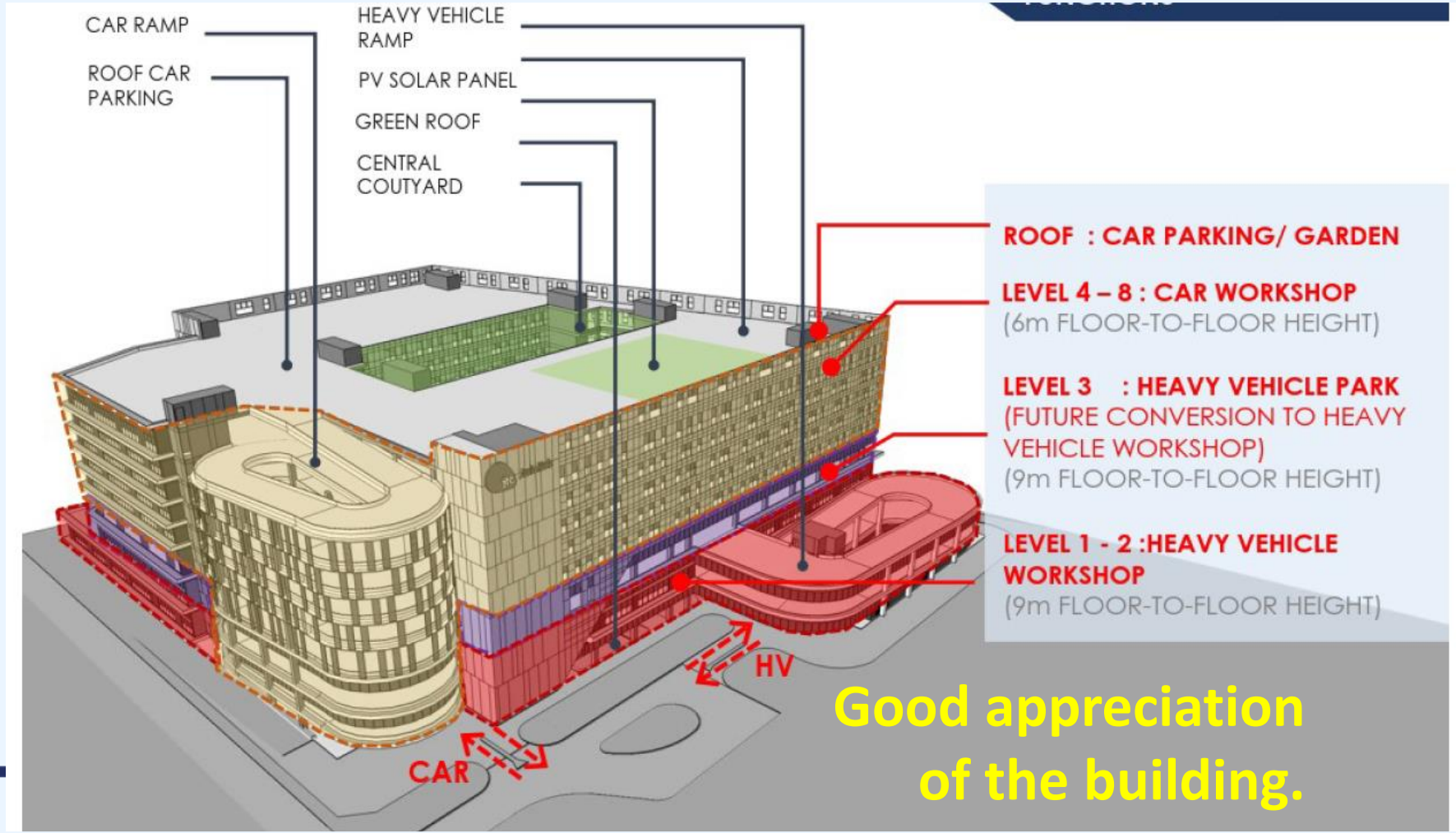
Examples : Good

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

Examples : Good

(But not all good)

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


CAR RAMP
ROOF CAR PARKING
HEAVY VEHICLE RAMP
PV SOLAR PANEL
GREEN ROOF
CENTRAL COUTYARD
ROOF : CAR PARKING/ GARDEN
LEVEL 4 – 8 : CAR WORKSHOP
(6m FLOOR-TO-FLOOR HEIGHT)
LEVEL 3 : HEAVY VEHICLE PARK
(FUTURE CONVERSION TO HEAVY VEHICLE WORKSHOP)
(9m FLOOR-TO-FLOOR HEIGHT)
LEVEL 1 - 2 :HEAVY VEHICLE WORKSHOP
(9m FLOOR-TO-FLOOR HEIGHT)
HV
CAR
Good appreciation of the building.

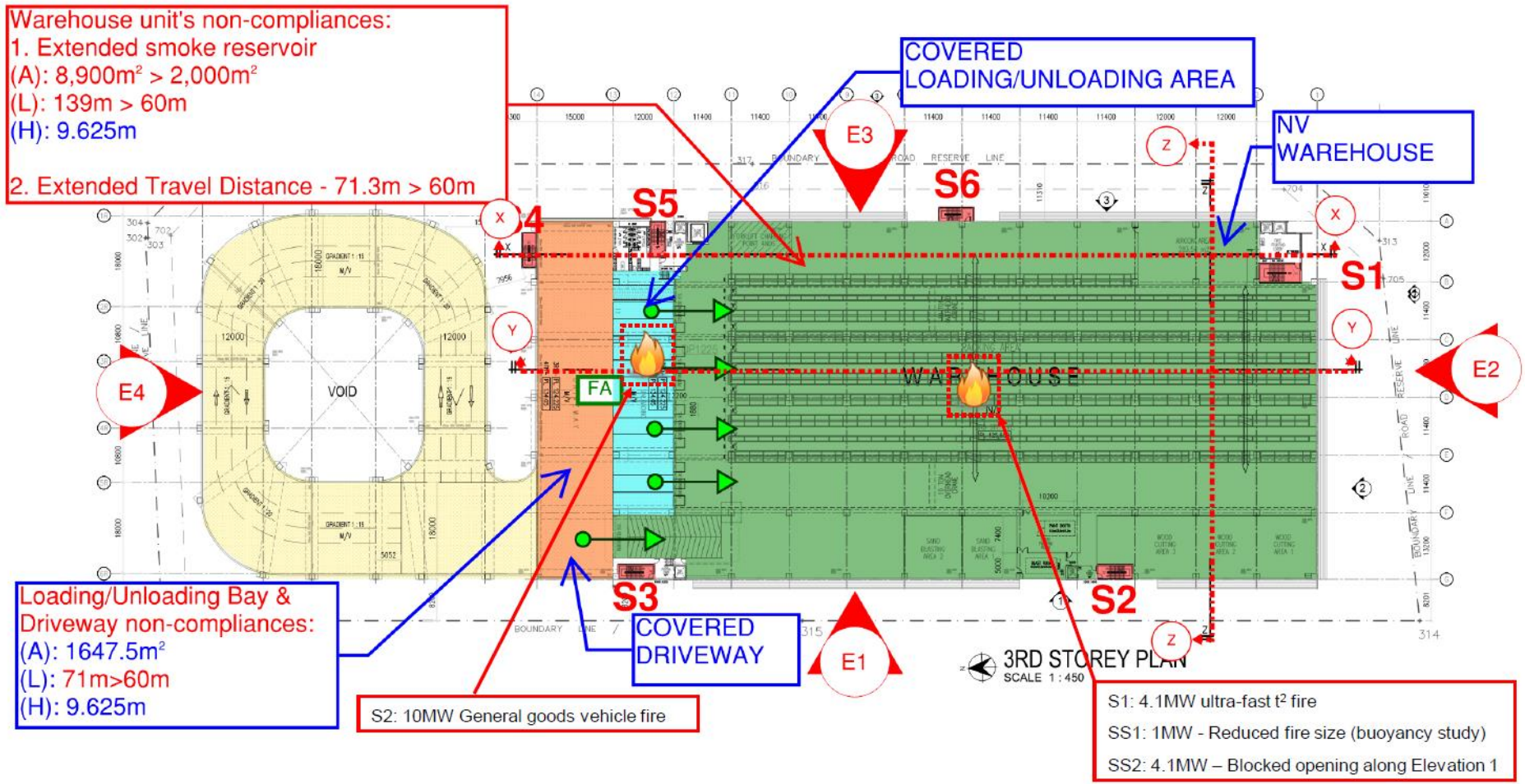
No.	Location	Part(s) of building affected by the deviation	Relevant prescriptive clause in Code of Practice for Fire Precautions in Buildings 2013	Corresponding root and sub-objectives of proposed deviation
1	4th to 10th storey	To allow smoke reservoir length to exceed 60m: • Smoke zone SZ-1 (GL 4-6/G-A) length of 71m • Smoke zone SZ-2 (GL 6-12/A-D) length of 69m	Clause 7.6.10 - *The maximum length of the smoke reservoir shall not exceed 60m.*	R7.1, R7.2, S7.1, S7.2

Good : Use of colours.

Bad : Why underline everything ?

No.	Location	Part(s) of building affected by the deviation	Relevant prescriptive clause in Code of Practice for Fire Precautions in Buildings 2013	Corresponding and sub-objecti proposed devi
1	Block 1 – Level 1	Distance from exit staircase (SS1 & ST1A) discharge point to exterior space opened to sky exceeds 10m (15.3m and 11.4m)	2.3.3(c)(ii)(3)	R2.1, S2.14
2	Block 5 – Level 1	Distance from exit staircase (SS 5) discharge point to exterior space opened to sky exceeds 10m (10.3m)	2.3.3(c)(ii)(3)	R2.1, S2.14
3		Seven (7) residential units (exceeding four (4) units) opening into the designated escape passageway at grade level into which the exit staircase discharges	2.3.3(c)(ii)(4)	

Proposed Fire Scenarios



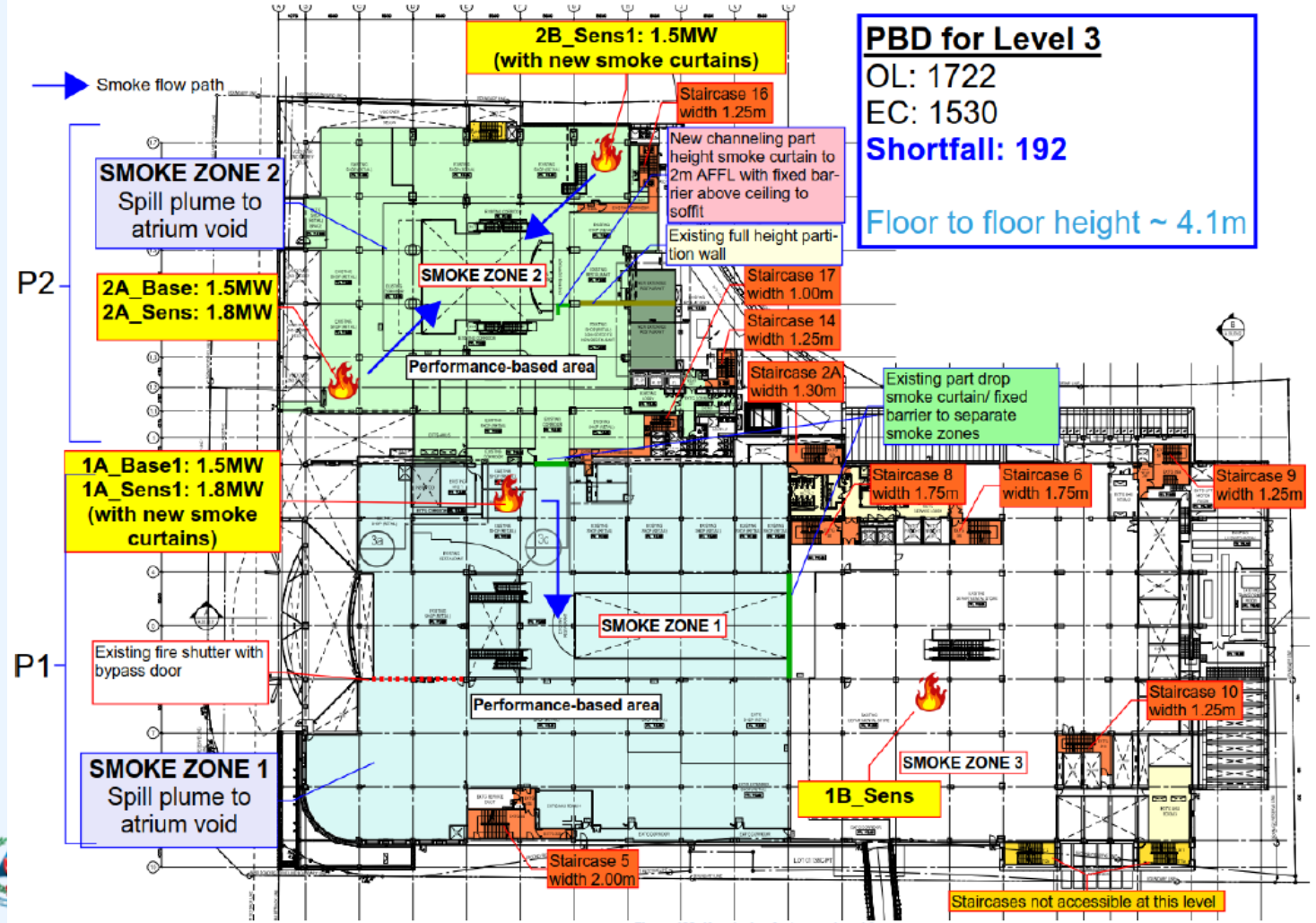
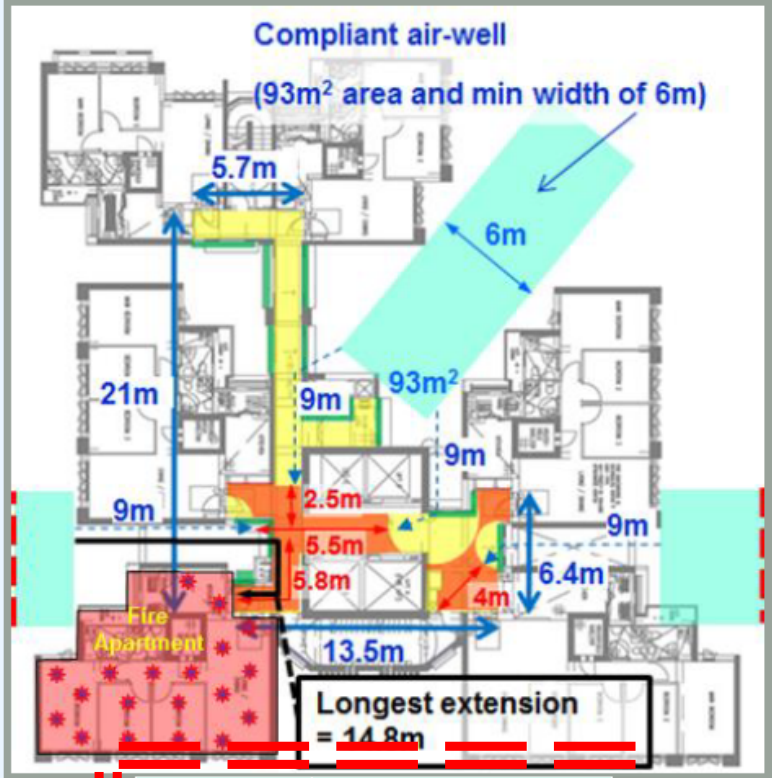
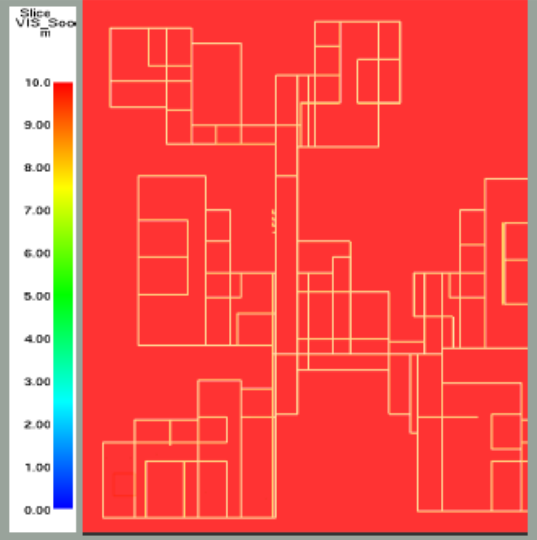


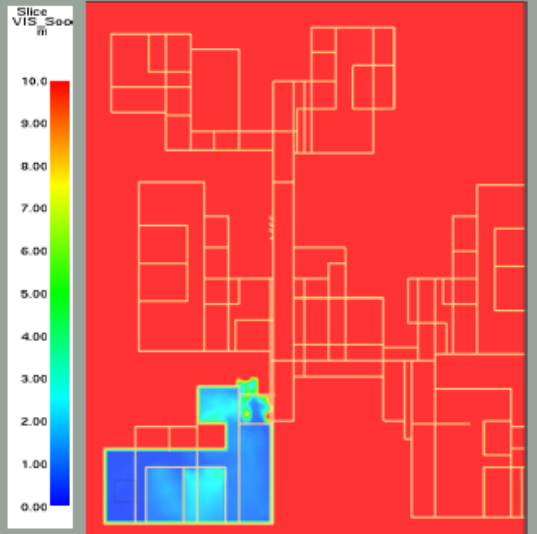
Figure 133: Key design features – Level 3



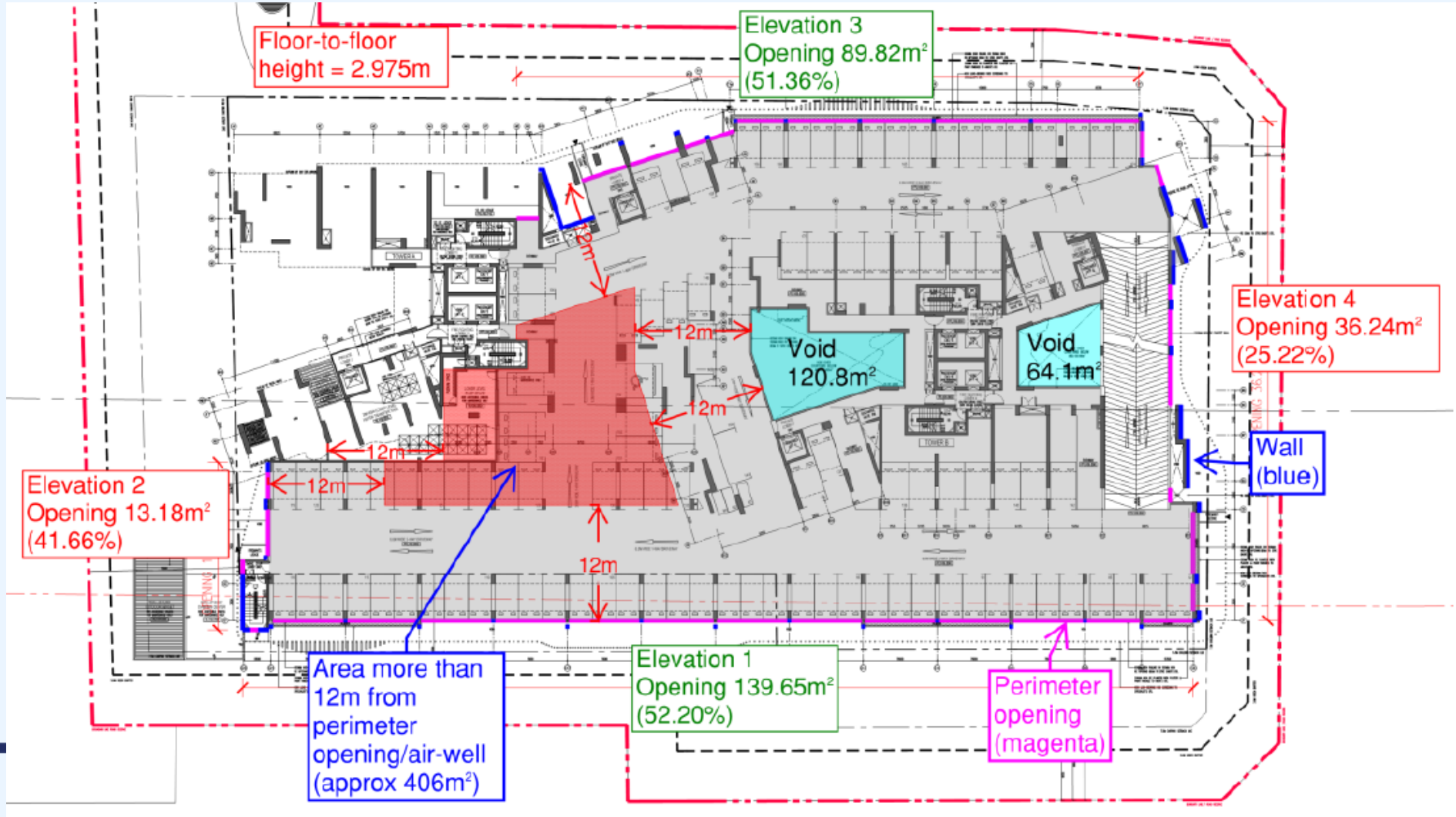
Time	Event
0s – 60s	Fire Door Closed
60s – 120s (60s interval)	Smoke layer drops to 20% ceiling - Fire Door Opens @ 60s
120s onwards	Fire Door Closed

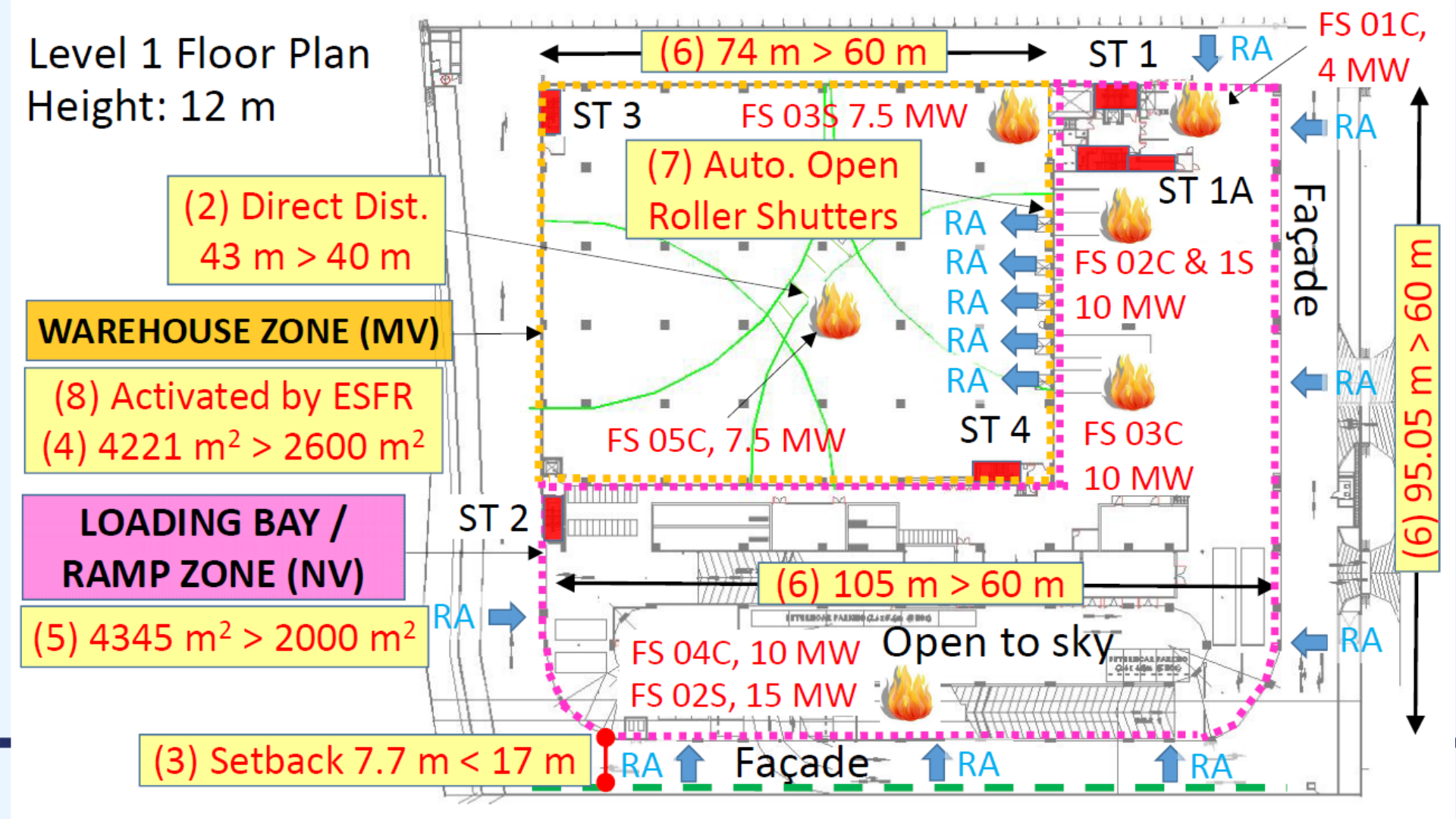


Soot visibility slice @ Z = 2.0m from FFL @ T = 0s



Soot visibility Slice @ Z = 2.0m from FFL when door opened for 5s @ T = 65 s


Floor-to-floor height = 2.975m
Elevation 3
Opening 89.82m²
(51.36%)
Elevation 4
Opening 36.24m²
(25.22%)
Void
120.8m²
Void
64.1m²
12m
12m
12m
12m
12m
Wall
(blue)
Elevation 2
Opening 13.18m²
(41.66%)
Area more than 12m from perimeter opening/air-well (approx 406m²)
Elevation 1
Opening 139.65m²
(52.20%)
Perimeter opening (magenta)


Level 1 Floor Plan
Height: 12 m
(6) 74 m > 60 m
ST 1
RA
FS 01C, 4 MW
ST 3
FS 03S 7.5 MW
(7) Auto. Open Roller Shutters
RA
ST 1A
(2) Direct Dist. 43 m > 40 m
RA
RA
RA
RA
FS 02C & 1S 10 MW
Façade
WAREHOUSE ZONE (MV)
(8) Activated by ESFR
(4) 4221 m² > 2600 m²
RA
RA
FS 05C, 7.5 MW
ST 4
FS 03C 10 MW
(6) 95.05 m > 60 m
LOADING BAY / RAMP ZONE (NV)
ST 2
(6) 105 m > 60 m
RA
(5) 4345 m² > 2000 m²
FS 04C, 10 MW
FS 02S, 15 MW
Open to sky
RA
(3) Setback 7.7 m < 17 m
RA
Façade
RA
RA

Examples : Bad

Location affected by Performance-Based Solution	Corresponding Clauses	Design Solution and Method of Assessment	Acceptance Criteria
Units at retail podiums (P1 and P2) levels 3-5 (exclude anchor tenant & departmental store). Refer to Figure 7 to Figure 9 for PBD areas.	Cl.2.2.5 Table 2.2A Root Objectives: - R2.1 Sub-objectives: - S2.1, S2.2, S2.6, S2.13	To allow an increase in occupant numbers on levels 3-5, beyond the exit capacity allowed for in the prescriptive code requirement.	Based on achieving the life safety criteria for smoke and heat nominated in the approved FEDB and section 7.0 of this report, i.e. "PBD is deemed acceptable if the ASET/RSET results achieved a safety factor of 2 for base case design and 1.2 for sensitivity studies"

Issues to the left please.

	Locations affected by the PB Solution	Relevant Prescriptive Clause	Corresponding Root & Sub-Objectives	Design Solution	Acceptance Criteria
a)	Review the effectiveness of the natural and/or mechanical engineered smoke control system for the rail depot located at basement 1 and basement 2 and the bus depot generally located at 1st storey to 3rd storey above ground to	7.6.7(a) 7.6.10 7.6.13(d) 7.6.16	Root Objectives - R7.1 Sub-Objectives - S7.1 and S7.2	Passive design of the underground MRT depot and Bus depot with natural replacement air and vent shafts/openings to facilitate natural or mechanical discharge of smoke in the event of fire incidents. The underground deport will be subdivided into several fire smoke zones of not more than 40,000m2, each zone will be design with natural or mechanical smoke vents and passive natural replacement opening to facilitate discharge of smoke during fire incidents.	a. untenable condition as mentioned below will not arise throughout the evacuation period. b. ASET at least 2 times of RSET

What are the deviations ??

Table 3: Details of Alternative Solutions at part(s) of the building affected by the performance-based solution.

Part(s) of the building affected by performance-based solution	Relevant Prescriptive Clause and Alternative Solutions	Relevant root and sub-objectives	Design solution	Acceptance Criteria
Car parks decks (2nd to 6th storey)	Clause 3.2.8(c)(i) – The requirements of Clause 3.2.1 may be exempted if open sided car parking decks having not less than 50% of the sides permanently open and unobstructed, and such openings being evenly distributed along each of the perimeter walls and on every individual floor/deck, excluding perimeter walls to air-well, so as to provide cross ventilation to all parts of the car parking decks; Clause 3.2.8(c)(ii) – No part of the floor space shall be more than 12m from the openings on the perimeter walls of the building or air-well. Air-well where provided for this purpose shall have a superficial plan area of not less than 10m², or 0.1m² for every 300mm of height, whichever is greater, and have a minimum dimension on plan of 2000mm, open vertically to the sky for its full height.	Root objectives – R6.2 Sub-objectives: S6.2	Automatic sprinkler system. Large openings along the car parks perimeters and two voids at the center.	Refer to Section 10 of the report

What would be very helpful to highlight ??

What are the deviations ??

Alternative Solution

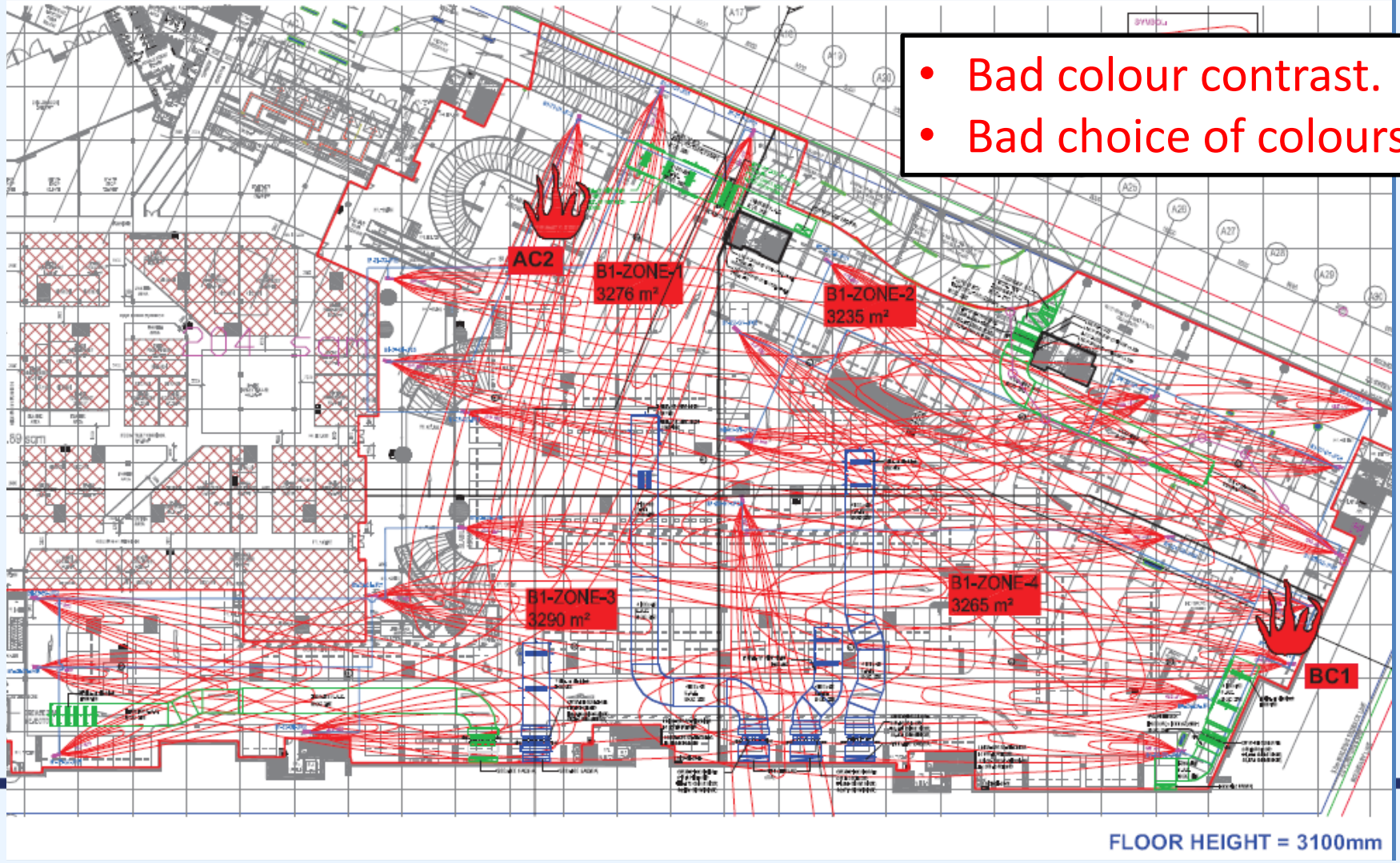
- 1st to 4th storey warehouses are divided into two smoke zones with the maximum smoke reservoir size of 5225 m^2 and length is approximately 112m.

- 5th and 6th storey warehouse storage is a single smoke zone of 6,500 m^2 and the length approximately is 112m.

Standardise :

Comma / No-comma.

Helps with the word-search.



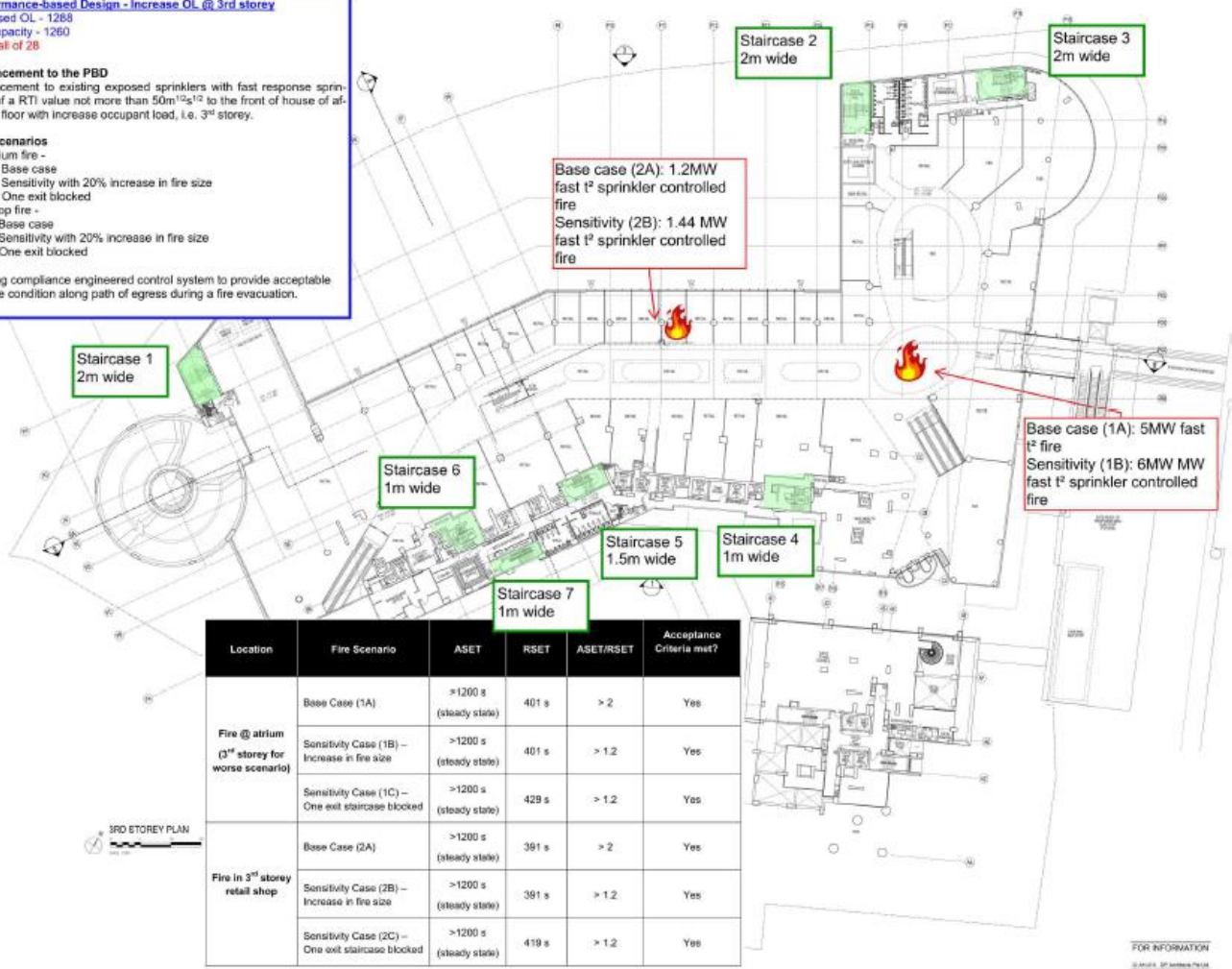
- Bad colour contrast.
- Bad choice of colours

Performance-based Design - Increase OL @ 3rd storey
Proposed OL - 1288
Exit capacity - 1260
Shortfall of 28

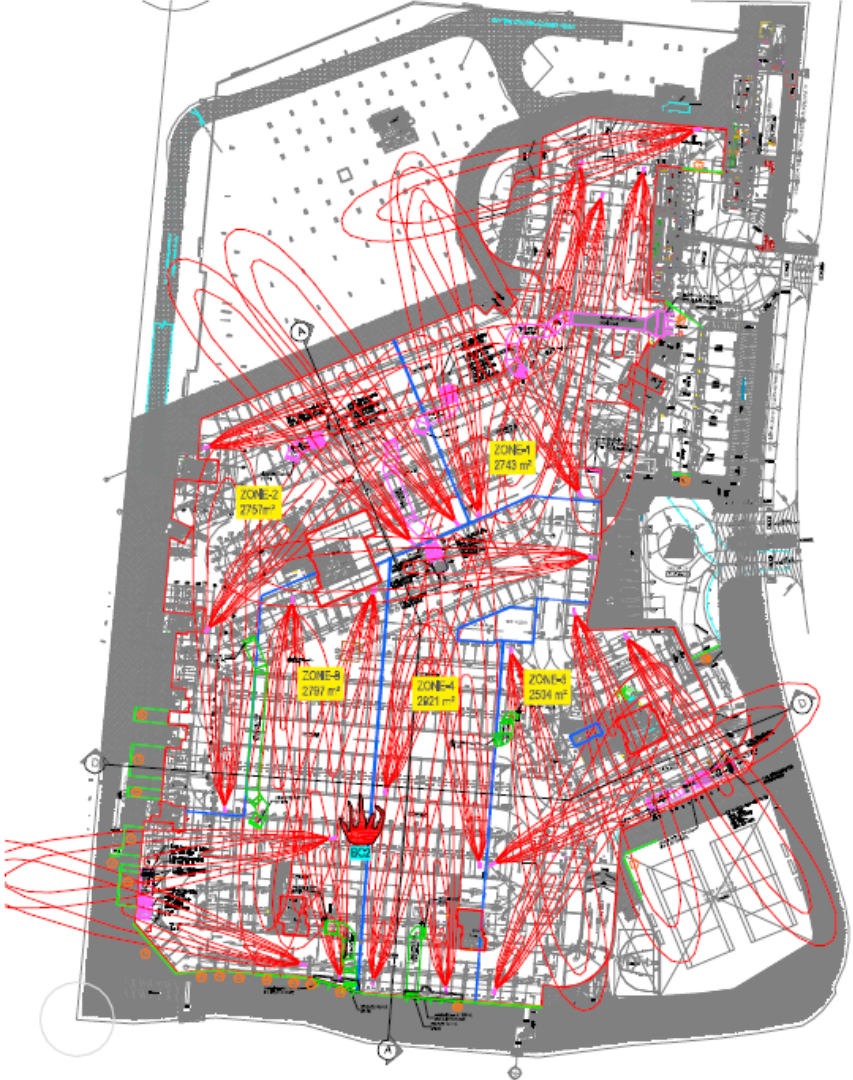
Enhancement to the PBD
Enhancement to existing exposed sprinklers with fast response sprinklers of a RTI value not more than $50m^{1/2}s^{1/2}$ to the front of house of affected floor with increase occupant load, i.e. 3rd storey.

Fire Scenarios
(1) Atrium fire -
  (A) Base case
  (B) Sensitivity with 20% increase in fire size
  (C) One exit blocked
(2) Shop fire -
  (A) Base case
  (B) Sensitivity with 20% increase in fire size
  (C) One exit blocked

Existing compliance engineered control system to provide acceptable tenable condition along path of egress during a fire evacuation.



Location	Fire Scenario	ASET	RSET	ASET/RSET	Acceptance Criteria met?
Fire @ atrium (3rd storey for worse scenario)	Base Case (1A)	>1200 s (steady state)	401 s	> 2	Yes
	Sensitivity Case (1B) – Increase in fire size	>1200 s (steady state)	401 s	> 1.2	Yes
	Sensitivity Case (1C) – One exit staircase blocked	>1200 s (steady state)	429 s	> 1.2	Yes
Fire in 3rd storey retail shop	Base Case (2A)	>1200 s (steady state)	391 s	> 2	Yes
	Sensitivity Case (2B) – Increase in fire size	>1200 s (steady state)	391 s	> 1.2	Yes
	Sensitivity Case (2C) – One exit staircase blocked	>1200 s (steady state)	419 s	> 1.2	Yes



FLOOR HEIGHT 3000MM TO 4100MM

Zones Sizes do not exceed 3000 sqm
Main Exhaust Points located away from Exits
Fire Scenario BC2

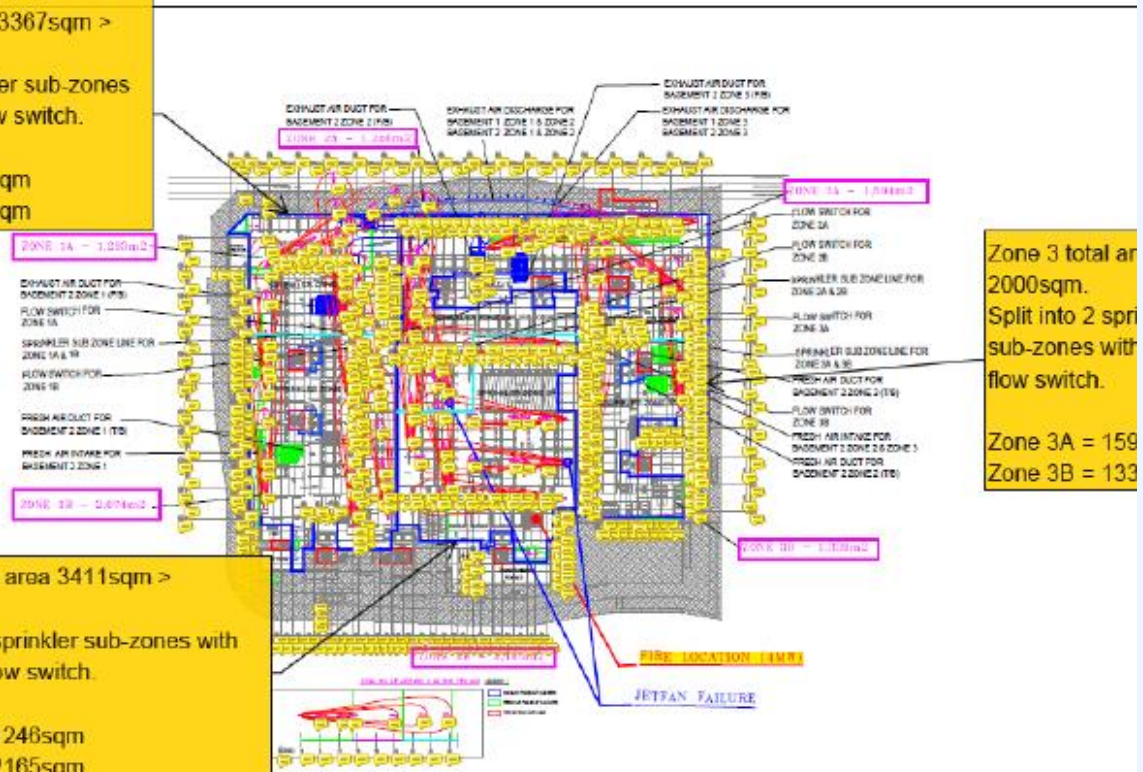
"Staircases have been marked in red for easy location."

Really ????

LOWER 1ST STOREY PLAN

Zone 1 total area 3367sqm > 2000sqm.
Split into 2 sprinkler sub-zones with individual flow switch.

Zone 1A = 1,293sqm
Zone 1B = 2,074sqm



Zone 3 total ar
2000sqm.
Split into 2 spri
sub-zones with
flow switch.

Zone 3A = 159
Zone 3B = 133

Zone 2 total area 3411sqm > 2000sqm.
Split into 2 sprinkler sub-zones with individual flow switch.

Zone 2A = 1246sqm
Zone 2B = 2165sqm

PB ISSUES

1. JET FAN ZONES > 2,000m2
2. JET FAN SUCCESSIVE LAYOUT > $\frac{2}{3}$ FAN TRAJECTOREY APART

TRIAL DESIGN

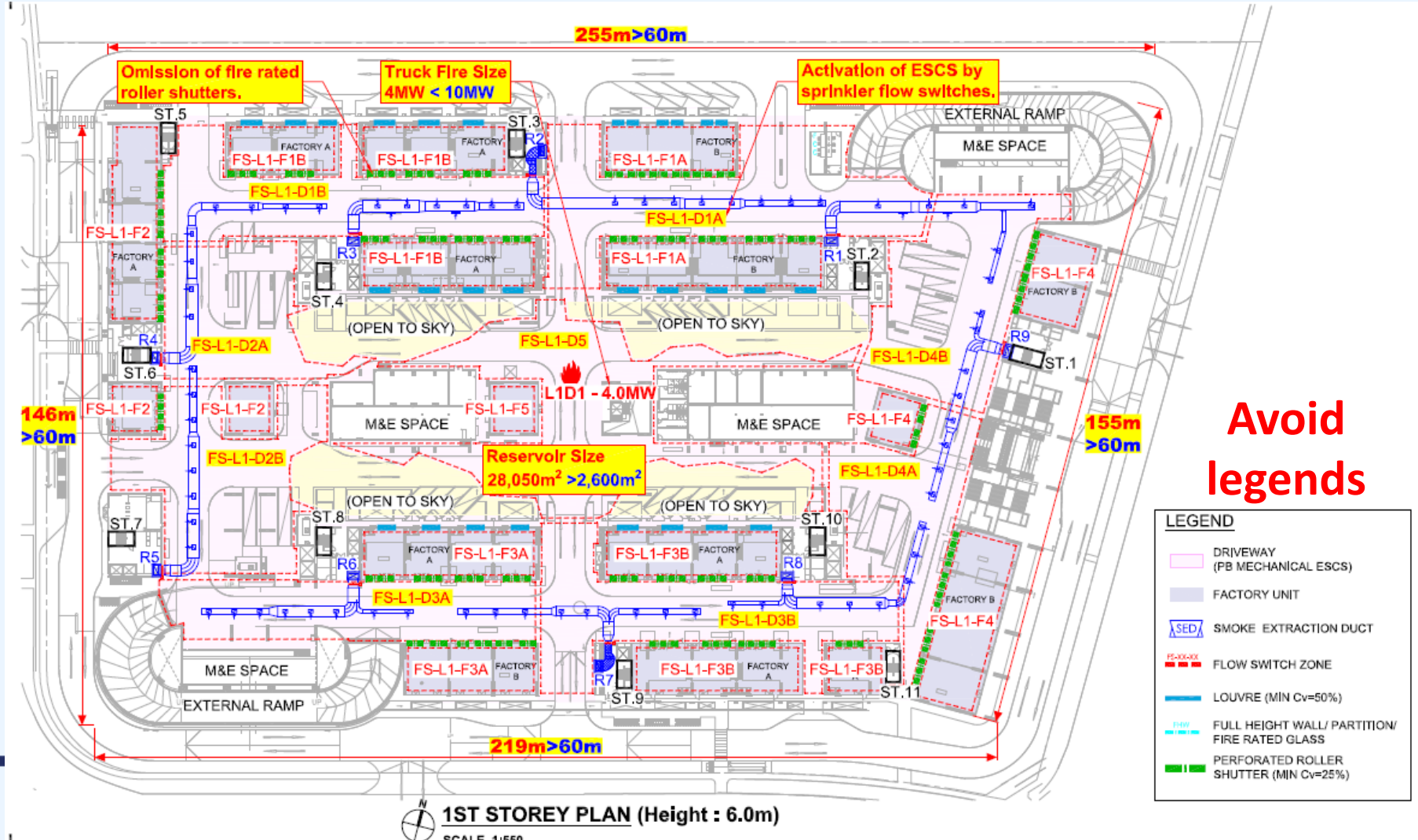
01 x PASSENGER CAR ON FIRE 4MW (CONSTANT)
02 x JET FANS ASSUMED FAILURE

Jet Fan max trajectory 41.5m
2/3 fan trajectory is 27.1m
Placement of successive fans at 32m or less apart. FSR3 allows for fans > 2/3 trajectory apart if CFD shows meeting of acceptance criteria

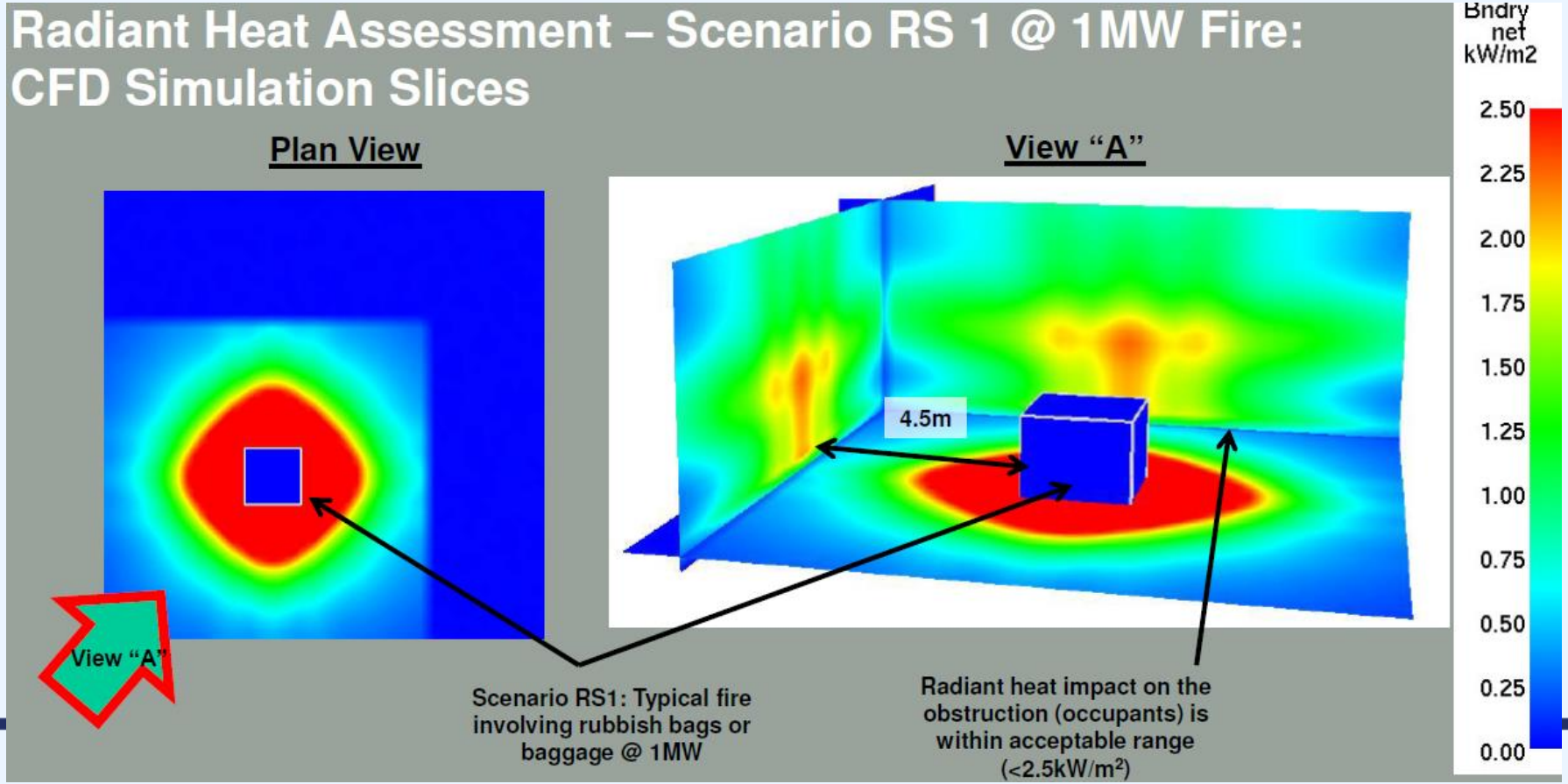
BASEMENT 1 PLAN - DUCTLESS CARPARK MECHANICAL VENTILATION SYSTEM

YSTEM DESIGNED TO 9 AIR-CHANGES PER HOUR IN EMERGENCY MODE

SCDF
The Life Saving Force

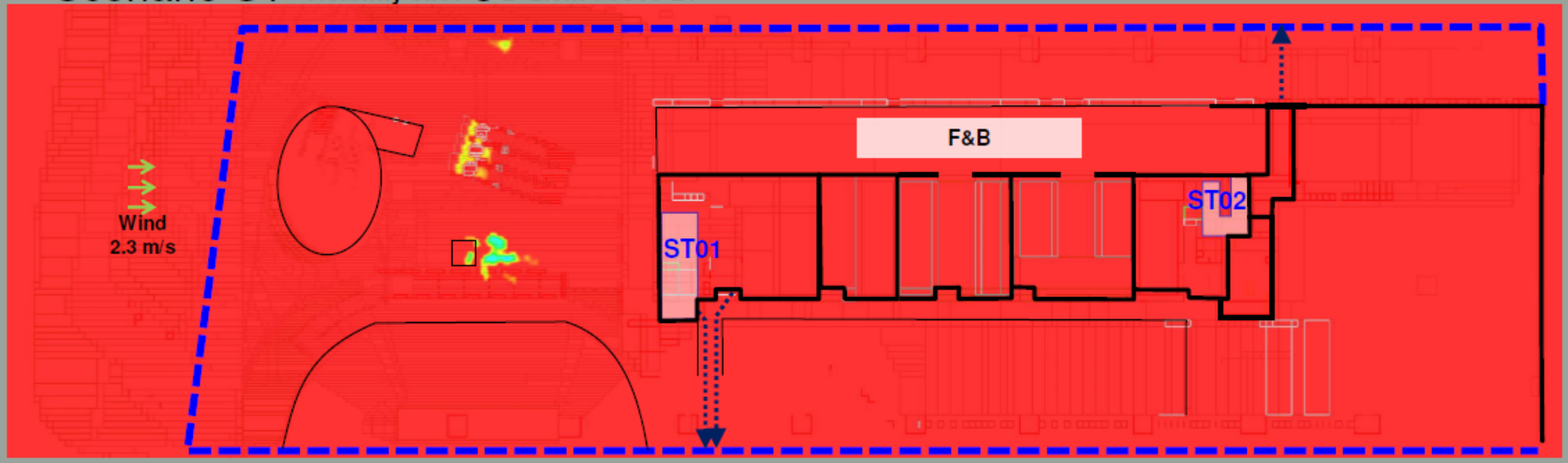

255m>60m
Omission of fire rated roller shutters.
Truck Fire Size 4MW < 10MW
Activation of ESCS by sprinkler flow switches.
EXTERNAL RAMP
M&E SPACE
ST.5
ST.3
R2
FS-L1-F1B
FS-L1-F1A
FS-L1-D1B
FS-L1-D1A
FS-L1-F2
R3
R1
ST.2
ST.4
(OPEN TO SKY)
FS-L1-F4
FS-L1-D2A
FS-L1-D5
FS-L1-D4B
R4
R9
ST.1
ST.6
L1D1 - 4.0MW
146m >60m
155m >60m
FS-L1-F5
Reservoir Size 28,050m² >2,600m²
FS-L1-D2B
FS-L1-D4A
ST.7
ST.8
ST.10
R5
R6
R8
FS-L1-F3A
FS-L1-F3B
FS-L1-D3A
FS-L1-D3B
R7
ST.9
ST.11
219m>60m
1ST STOREY PLAN (Height : 6.0m)
Avoid legends
LEGEND
DRIVEWAY (PB MECHANICAL ESCS)
FACTORY UNIT
SED
SMOKE EXTRACTION DUCT
FS-XX-XX
FLOW SWITCH ZONE
LOUVRE (MIN Cv=50%)
FHW
FULL HEIGHT WALL/ PARTITION/ FIRE RATED GLASS
PERFORATED ROLLER SHUTTER (MIN Cv=25%)

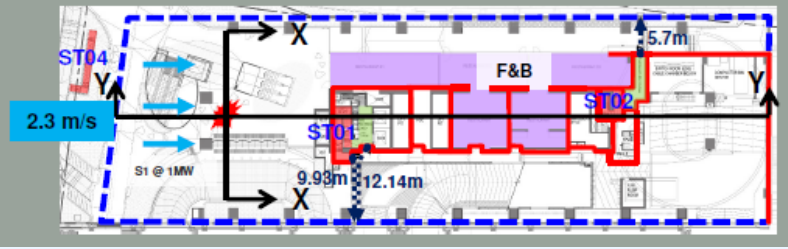
Something critical is missing from these following three slides??
[Don't let us guess/assume.]



Assessment – Tenable Conditions for Occupant Life Safety : Smoke Visibility & Gas Temperature:- CFD Simulation Slices

- Scenario S1 **Visibility slice @ z=2.5m above L1**

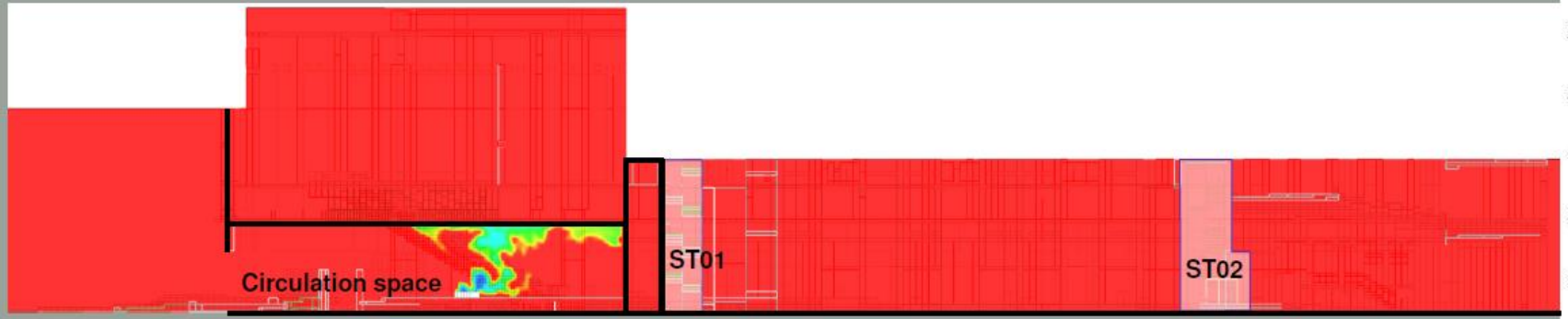




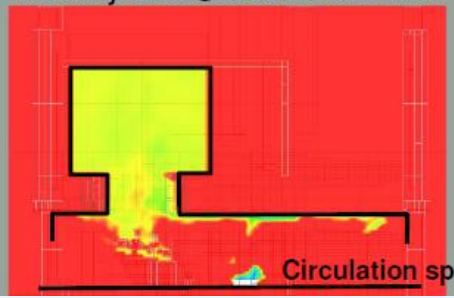
Assessment – Tenable Conditions for Occupant Life Safety : Smoke Visibility & Gas Temperature:- CFD Simulation Slices

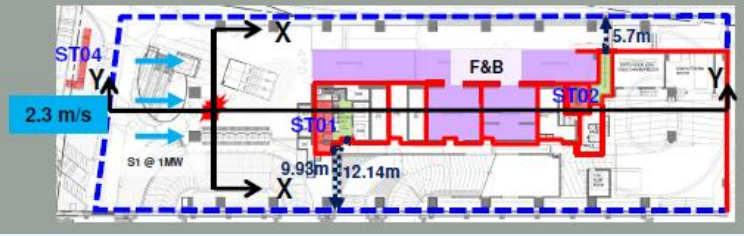
- Scenario S1

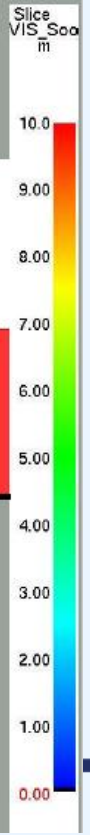
Visibility slice @ Y-axis across fire



Visibility slice @ X-axis across fire







PB Administrative Requirements (Full PB? or Waiver with fire engineering? Or Letter of No Objection)

Full PB Framework:

1. Changes affecting original PB areas.
2. New PB deviations.
3. Same deviation in new areas.

Example 1 :

FER approved with smoke reservoir 4,000 m2.
A/A works increases smoke reservoir to 6,000 m2.

Example 2 :

FER approved with only smoke reservoir and travel distance issues.
Compartment issues discovered.

Example 3 :

FER approved with travel distance on levels 1 and 2.
Travel distance issues discovered on level 3.

Full PB Framework:

1. Changes affecting original PB areas.
2. New PB deviations.
3. Same deviation in new areas.

Example 4 :

FER has approved NV system with full openings.

A/A works to add rain screen.

Full PB Framework:

1. Changes affecting original PB areas.
2. New PB deviations.
3. Same deviation in new areas.

Formally submit **Amendment FEDB**, quoting original FEDB reference number.

Submission via :

- CORENET or
- SCDF Front counter

Example :

Previously approved : FEDB/000995/17

Amendment FEDB : FEDB/000995/1701, FEDB/000995/1702

Full PB Framework:

1. Changes affecting original PB areas.
2. New PB deviations.
3. Same deviation in new areas.

PB waiver allowed only:

1. For clauses in Circular (Dec 2015) and/or
2. If prescriptive WVR Decision specifies that WVR with additional fire engineering study is needed.

May still be directed to full PB in situations where :

- The relevant clause is in the Dec 2015 circular but there are other PB issues for the development. All fire engineering issues needs to be looked at holistically.

- Other fire engineering issues were not highlighted during the Prescriptive WVR application. All fire engineering issues needs to be looked at holistically.

Submission of PB Waiver when it should be full PB

- ***Rejection : Issues to be regularized under the full performance based framework as highlighted to FSE on 12/3/18.***

Full PB Framework:

1. Changes affecting original PB areas.
2. New PB deviations.
3. Same deviation in new areas.

PB waiver allowed only:

1. For clauses in Circular (Dec 2015) and/or
2. If prescriptive WVR Decision specifies that WVR with additional fire engineering study is needed.

Letter of No Objection (Typically in another area) only if:

1. A & A works do not affect PB design at all:
   a) FSE/QP to assess (See SCDF Circular dated 18 Oct 2013)
   b) If unsure, FSE perform assessment and decide for yourself. FSE can issue LNO if:
      - Locations of A/A works are clearly in a non-PB related part of the building; or
      - A/A works give rise to the same (previously assessed) deviations in the PB area, but the performance-based results are obviously similar to earlier approved report, or performs better than results in the earlier approved report.
        - Example: Original PB involved travel distance non-compliance, and PB assessment is already approved. Subsequently, there are A&A works in the same PB area, and results in a shorter travel distance non-compliance.

Any Other Business

Any other business :

1. Manage your clients/QP.
    - We rather spend the time reviewing your reports.
    - Remind your client/QP not to contact us directly, but liaise through the FSE, no matter how urgent the cases are.
    - Potential consequence: Project delay
2. Number all Table and Figures.
3. For all reports (FEDB/FER/O&M/PRR)
    a) Every WVR/FEDB/FER/PRR must be self-sufficient. (Do not reference other reports for key details.)
    b) FSE & Peer Reviewer to also insert email address on the cover page of all reports.
4. Bring your own VGA cables/adapter for projection onto screen

Any other business :

5. Avoid communicating via CORENET Correspondences ONLY.
6. Compile whole report into a single document if possible. Do not give us in 10 parts.
7. Total size of report not to exceed 20MB.
8. Indicate correct reference numbers (ie FEDB/0000XX/YY) when submitting BP drawings at FER stage. **Else REJECT**

Any other business :

9. All reports are to be searchable.
10. Submit only the final results that shows trial design meets acceptance criteria.
11. “Discussion to be led by FSE”.
12. Consult only on PB issues.
13. Peer reviewer to differentiate (via **tabulation**) fire scenarios from FSE.
14. Revert to all queries within 3 months. **Else Disapprove/Rescind NOA**

Q & A

Queries received from FSEs:

1. Use of Fractional Effective Dose (FED)
   a. Is it through SCDF Consultation at the on-set of project, either for PB or wavier approach, to agree on the FED usage?
   b. If it is, what details SCDF needs for the consultation?
   c. Is the application of FED only applicable to new project or A&A works?

3.3 Where the fire engineering assessment requires an assessment of human tenability to be made, the following limits of acceptability will apply: — Acceptance Criteria

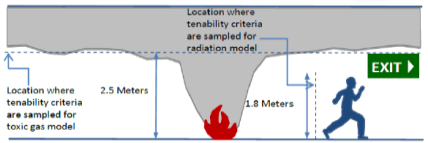


Figure 3.2 Tenability criteria to be sampled at 2.5m from the finish floor level.

(a) Smoke Temperature – The average upper layer smoke temperature shall not exceed 200°C measured at 2.5m height from finished floor level and the average lower layer smoke temperature shall not exceed 60°C. — Temperature

(b) Radiation – Where occupants are expected to egress past a fire, the radiative heat flux shall not exceed 2.5 kW/m². — Radiation

(c) Visibility at 2.5m above the floor level shall be greater than 10m. — Visibility

(d) Where the use of FED is to be used as an acceptance criterion, (for example, in situation where the ceiling is low and the use of acceptance criteria (a) to (c) is not feasible). — Fractional Effective Dose

Fractional Effective Dose (FED) for temperature and toxic gases shall not exceed 0.3.

The use of FED as a criterion shall be subject to SCDF's agreement. When proposed, the FSE would need to justify for FED criterion to be adopted in the design. Where FED analysis is permitted by SCDF, the guide for the sampling shall be as follows

(i) Methodology for FED determination — Methodology for FED determination

The recommended methodology for FED determination is proposed below. Depending on the nature of the deviation, FSE may propose other methodologies for determining FED. FSE would need to consult SCDF before embarking on the FEDB.

(1) FED is sampled at the floor on fire and at all the entrances to places of safety (Eg: Doors to staircases/smoke stop lobby or doors to the external). These are areas where queuing is expected to take place.

Snap shots of egress modelling would need to be submitted to SCDF to show when queuing has reached the peak. This is to justify areas where FED sampling will be carried out.

(2) Calculate or model the queuing domain and another 5 m away for the FED sampling.

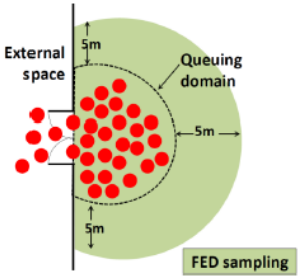


Figure 3.3 - FED Sampling

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SCDF The Life Saving Force

FSE-CPE = 3 hours

for FSE Dialogue 2018 attendees

Project Priority Card

for FSE Dialogue 2018 attendees

SCDF
The Life Saving Force

- ✓ 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 to us used.
- ✓ Allows priority for ONE
  - Review only; or
  - Presentation only
- ✓ Can be used to borrow VGA adaptor for consultation.

End