



# Fire Safety Design Principles for Malls

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08 December 2015

Safety Design in Buildings

Muscat Conference

Crowne Plaza Muscat, Tuesday, December 8, 2015





# Course Description

Mall design to compliance with codes such as NFPA 101 allows for a flexible design which facilitates the architectural and functional intent of malls. In addition, it allows for various elements of performance based design. This presentation highlights the design fundamentals and identifies some common misinterpretations of the code.



## Presenter

Zainul Abedeen has over 24 years of experience in Fire & Life Safety design. All his 24 years of experience have been within the Middle East. Since graduating with a B.Sc. in Mechanical Engineering from J.M.I. Central University New Delhi, India in 1991, he has designed fire protection systems, fire alarm systems, smoke control systems, prepared fire and life safety strategy, reports and specification for various types of buildings including convention centers, malls, retails, cinemas, food & beverage, hotels, residential and industrial buildings with a special expertise in high-rise and super tall buildings.

He is working with WSP | PB as a Principal Consultant – Fire & Life Safety and located in Dubai.



# Learning Objectives

- 1. Identifying Key Design Challenges*
- 2. Understanding Mall Design Principles*
- 3. Understanding Common Misinterpretations*

The purpose of this presentation is to convey technical knowledge to the conference participants.

The presentation also contains slides with text that summarises the content of the presentation and the main learning objectives.

These may be used to update CPD records for relevant organisations including the Chartered Institute of Building (CIOB).

# Key Design Challenges



High Occupant Loads



Means of Egress System Design

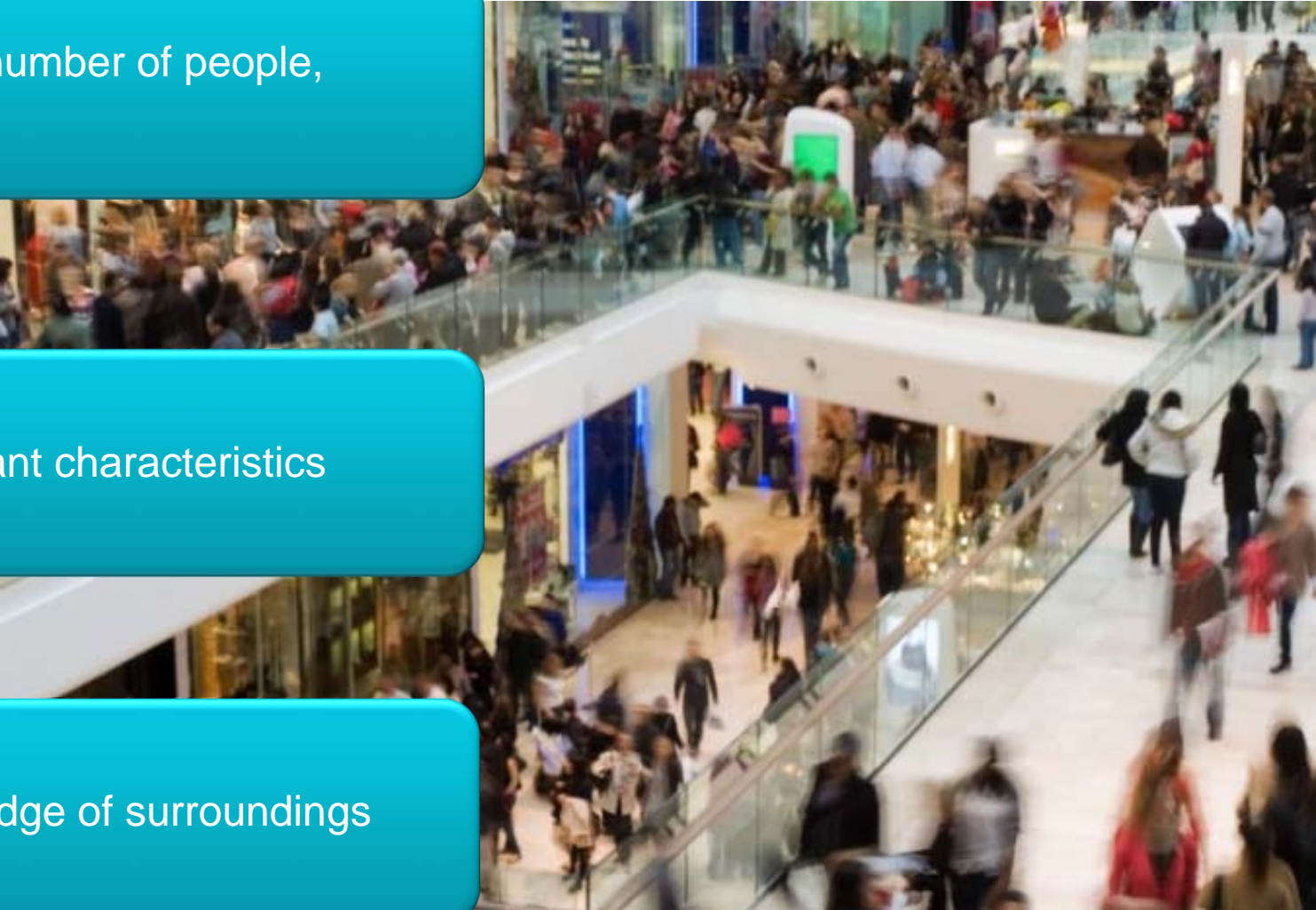
# High Occupancy Challenges



Large number of people, crowds

Occupant characteristics

Knowledge of surroundings



# Means of Egress Challenges



Occupant Loads

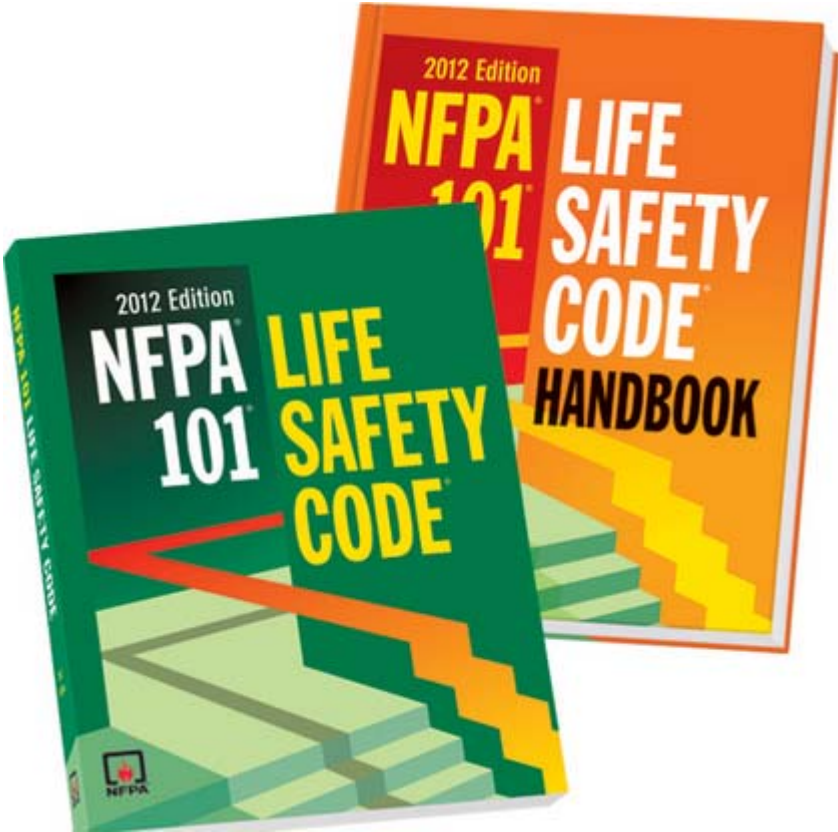
Exit Width

Travel Distance

Exit Discharge

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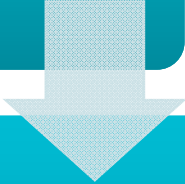
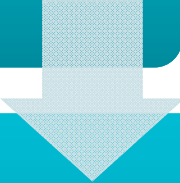
# NFPA 101 - Flexible Mall Design



Based on Mall  
Precedents  
and Research  
From Large  
Malls

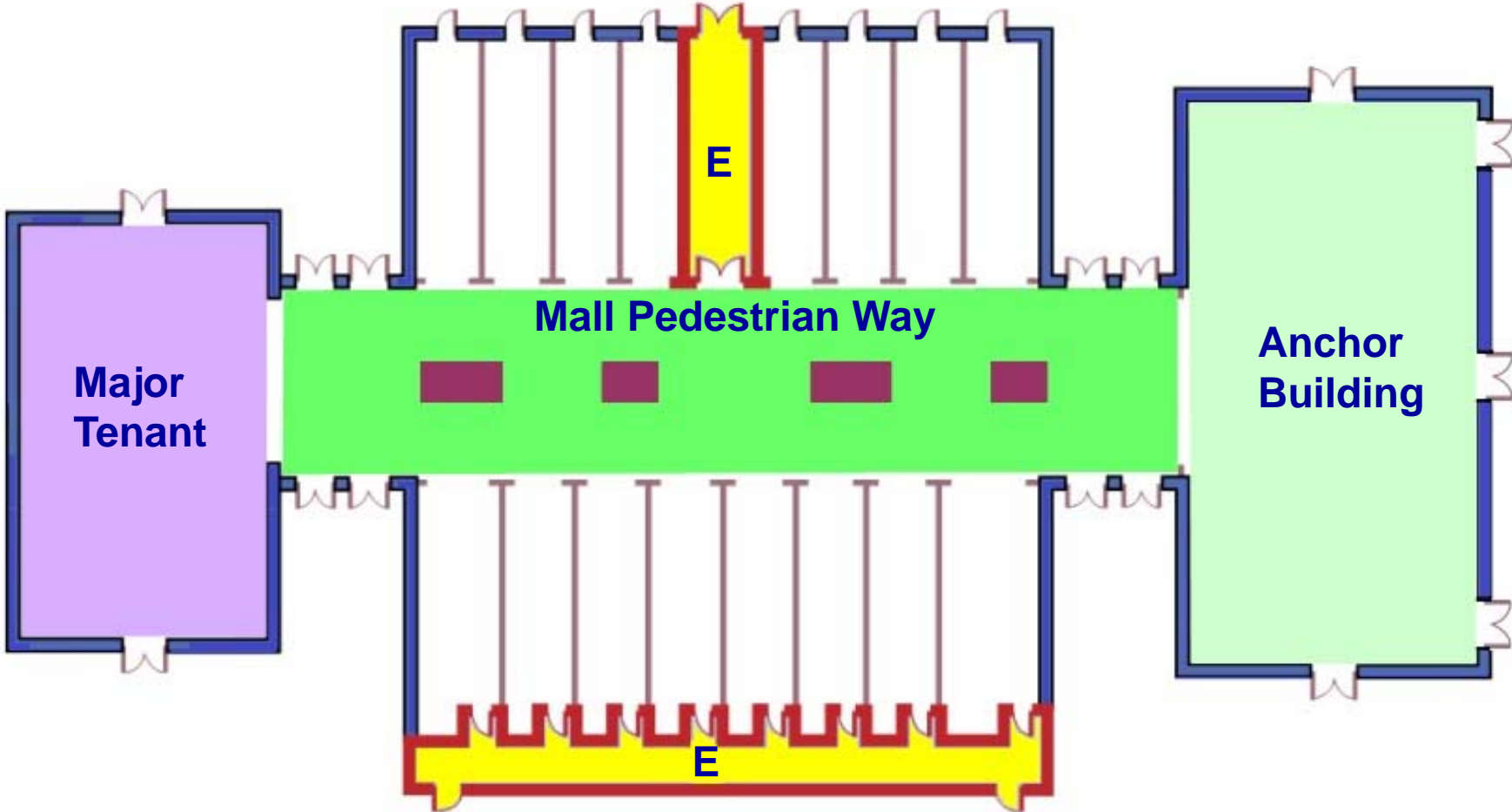
Occupant Load

Means of  
Egress

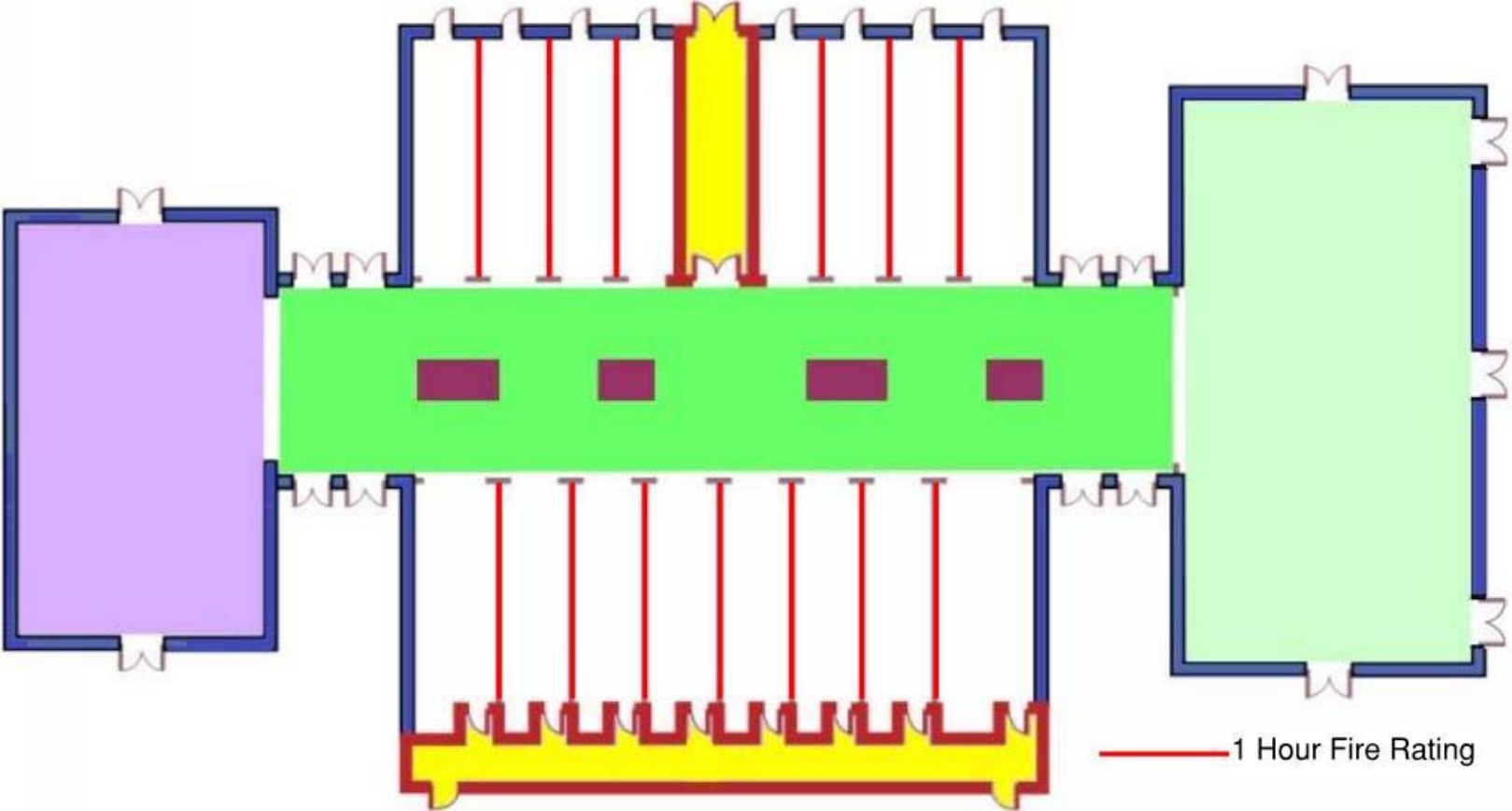




# A Typical Mall Building

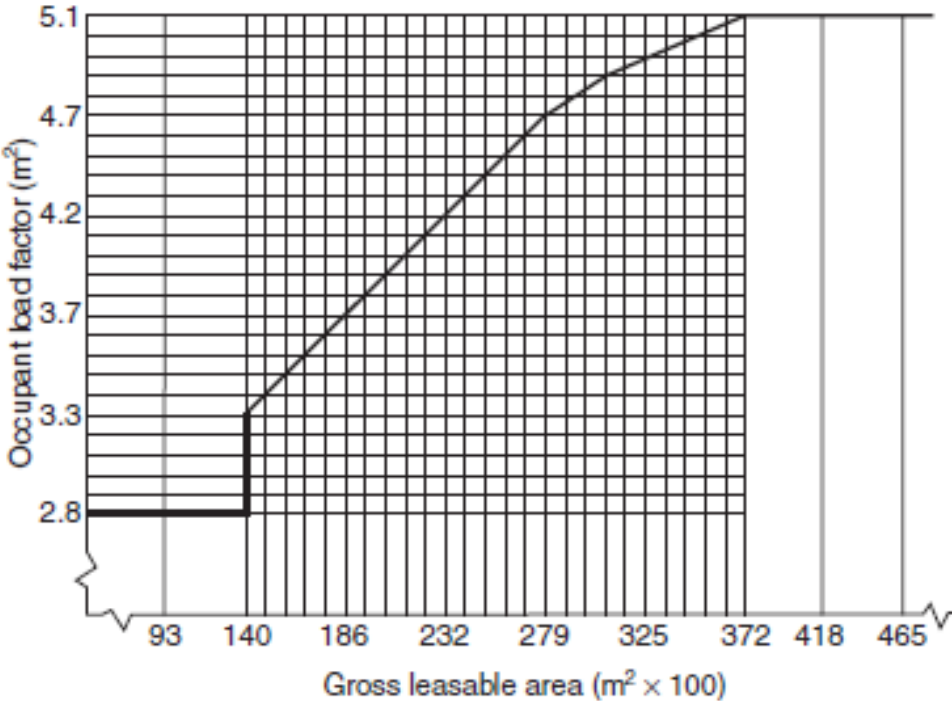


# Fire Resistance Rating - Mall Building



1 Hour Fire Rating

# Mall Occupant Load Assessments



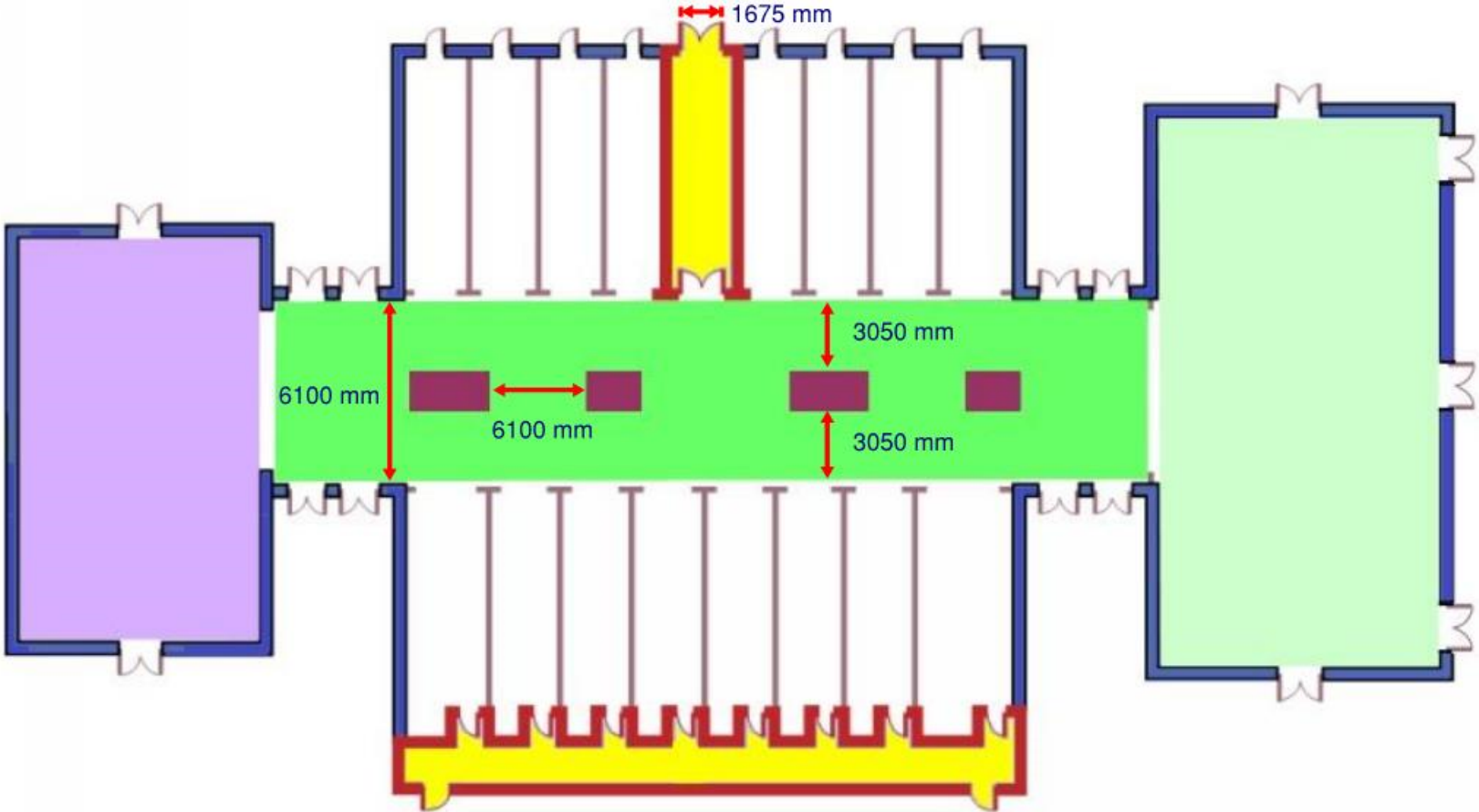
## Mall Egress Assessment

- Total GLA (Determines Factor)
- Assess Individual Levels

## Individual Unit Egress Assessment

- Assembly - 1.4m<sup>2</sup>/person
- Retail (Ground) - 2.8 m<sup>2</sup>/person
- Retail (Upper Levels) - 5.6m<sup>2</sup>/person
- Storage - 27.9m<sup>2</sup>/person

# Means of Egress-Minimum Width



# Unit Travel Distance



76m Internal Travel Distance

# Mall Travel Distance



61m Mall Travel Distance

Based on Smoke Control Provisions

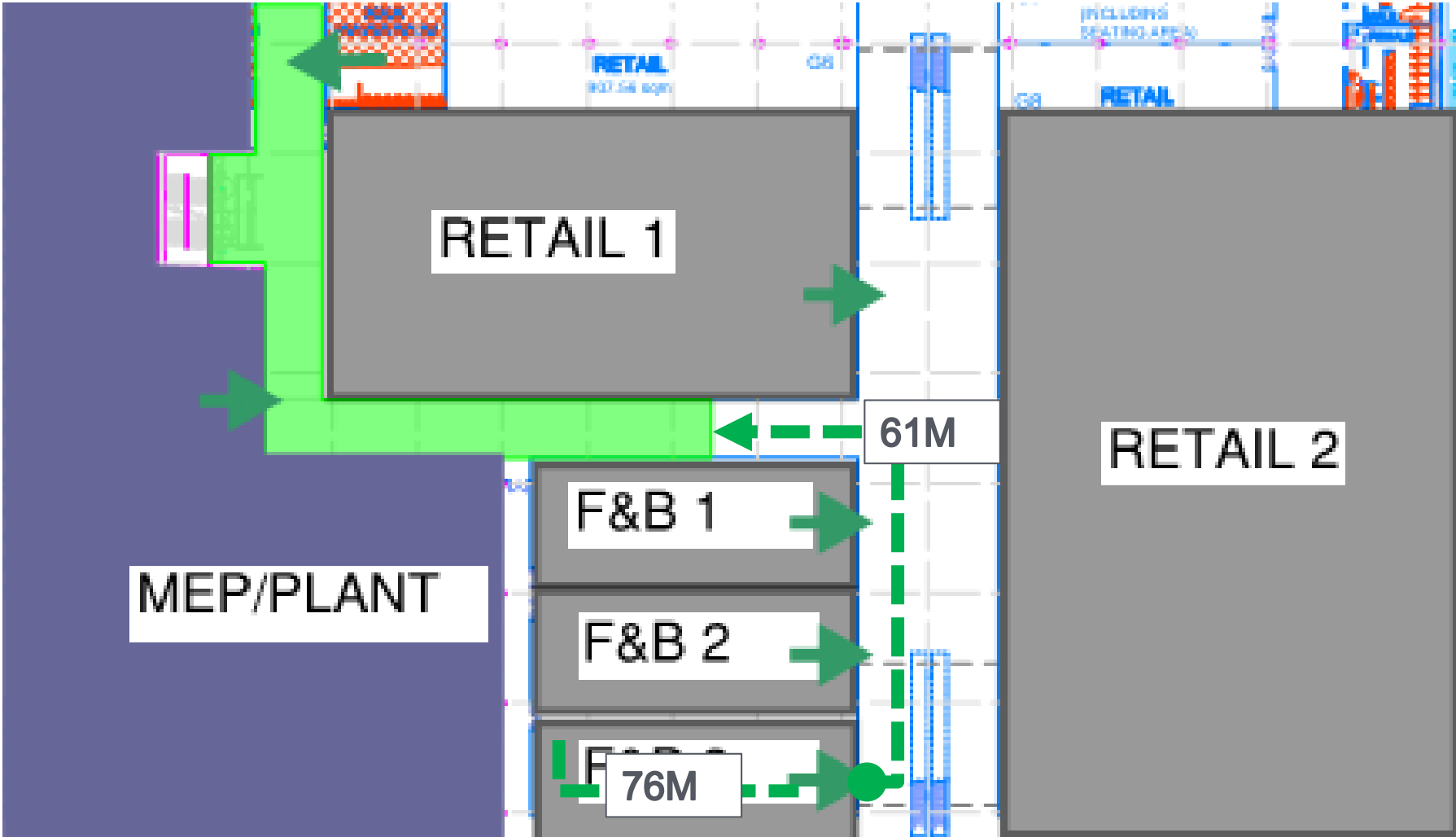
# Mall Exit Passageways



Flexibility on Exit Passageways

Openings and Services Permitted

# Mall Design Basics - Summary





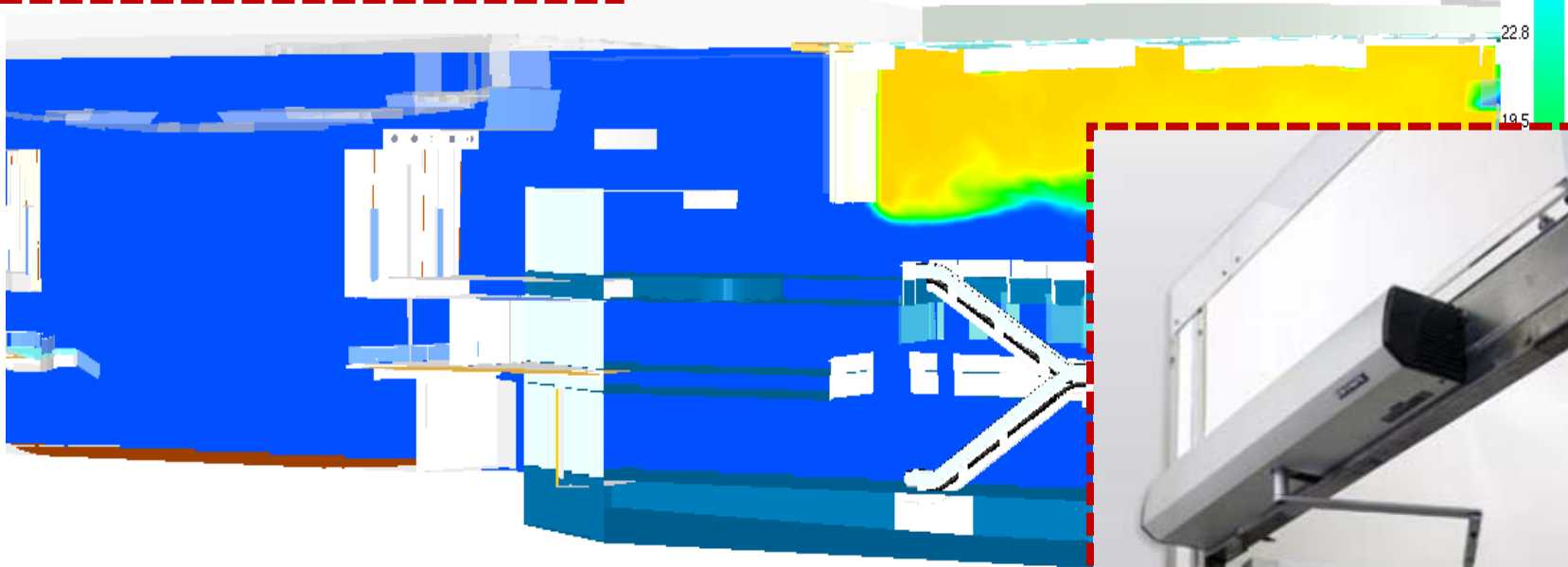
# Smoke Management - Mall



NFPA – Chapter 36 – MALL  
CONNECTING MORE THAN 2 LEVELS

GENERAL LOCAL PRACTICE –  
MINIMUM 6 AIR CHANGES

# Smoke Management - Mall



# Mall Expansion



# Expansion



Architecture

Coordinate interface with other engineering disciplines

Engineering

Mall Facilities Management



# Thank you

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