



Fire Safety Design Principles for Malls

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08 June 2015

Safety Design in Buildings

Bahrain Conference



Intercontinental Regency Bahrain, Monday, June 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. *Key Design Challenge*
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

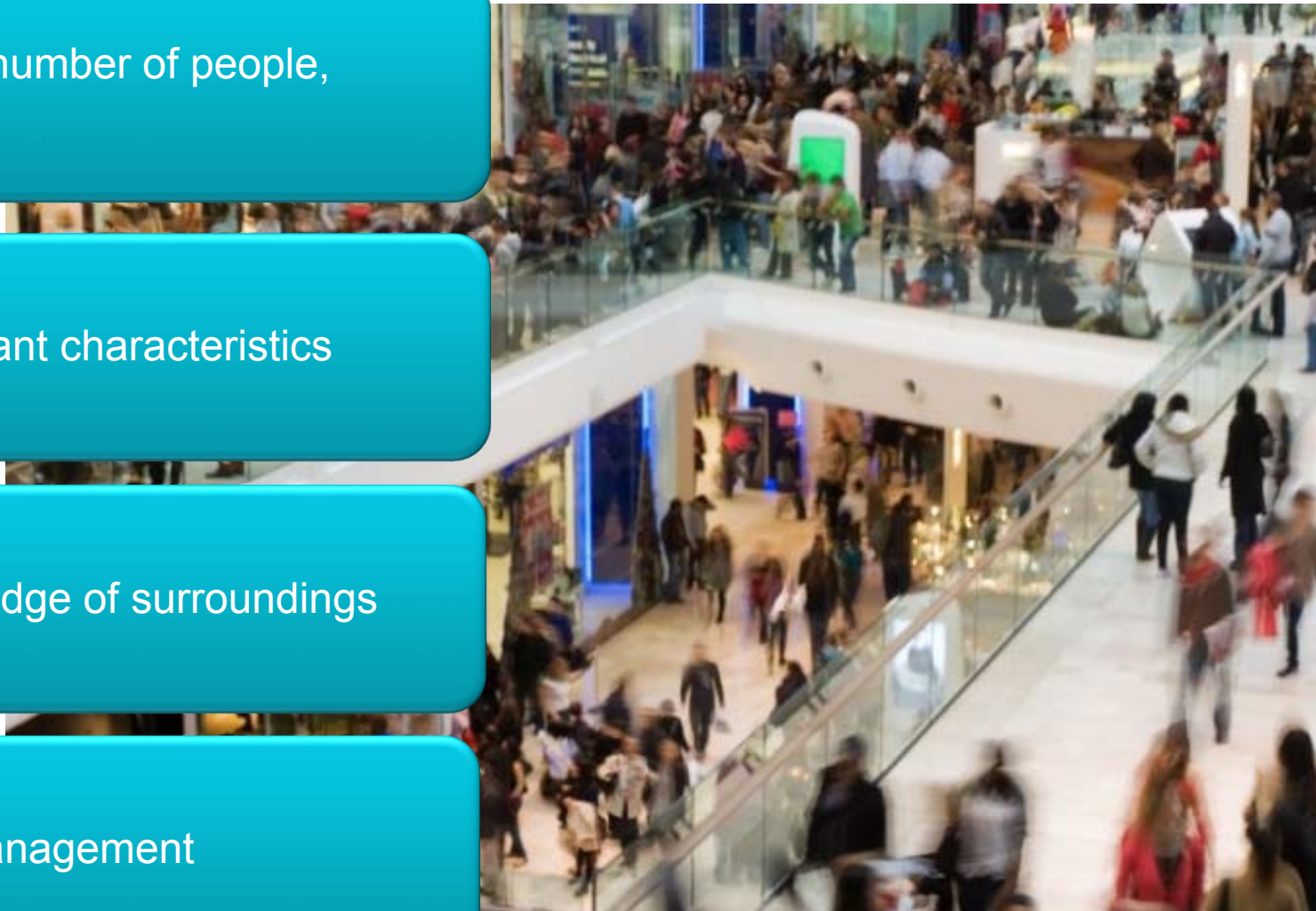


Large number of people, crowds

Occupant characteristics

Knowledge of surroundings

Mall management



Means of Egress Challenges



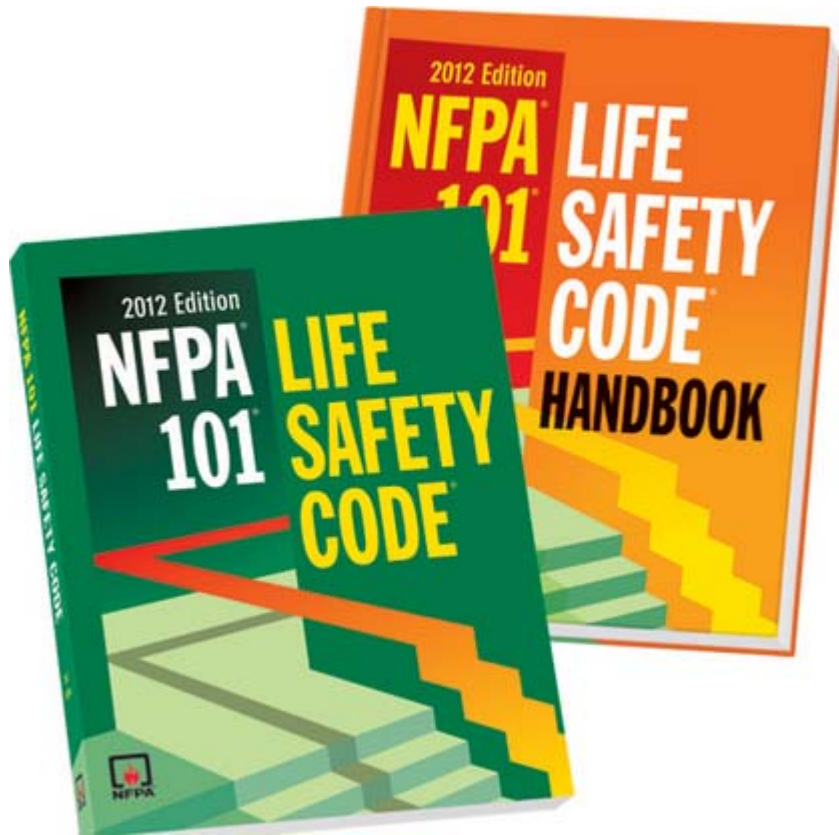
Occupant Loads

Exit Width

Travel Distance

Exit Discharge

NFPA 101 - Flexible Mall Design



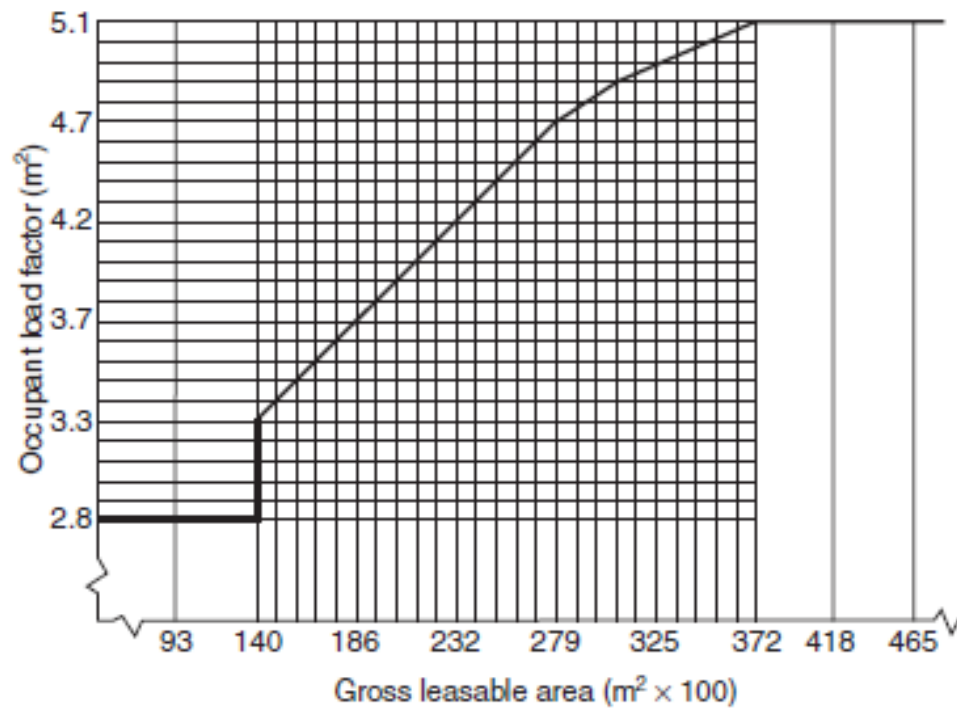
Based on Mall
Precedents and
Research From
Large Malls

Occupant Load

Means of Egress

Large
Connecting
Stores

Mall Occupant Load Assessments



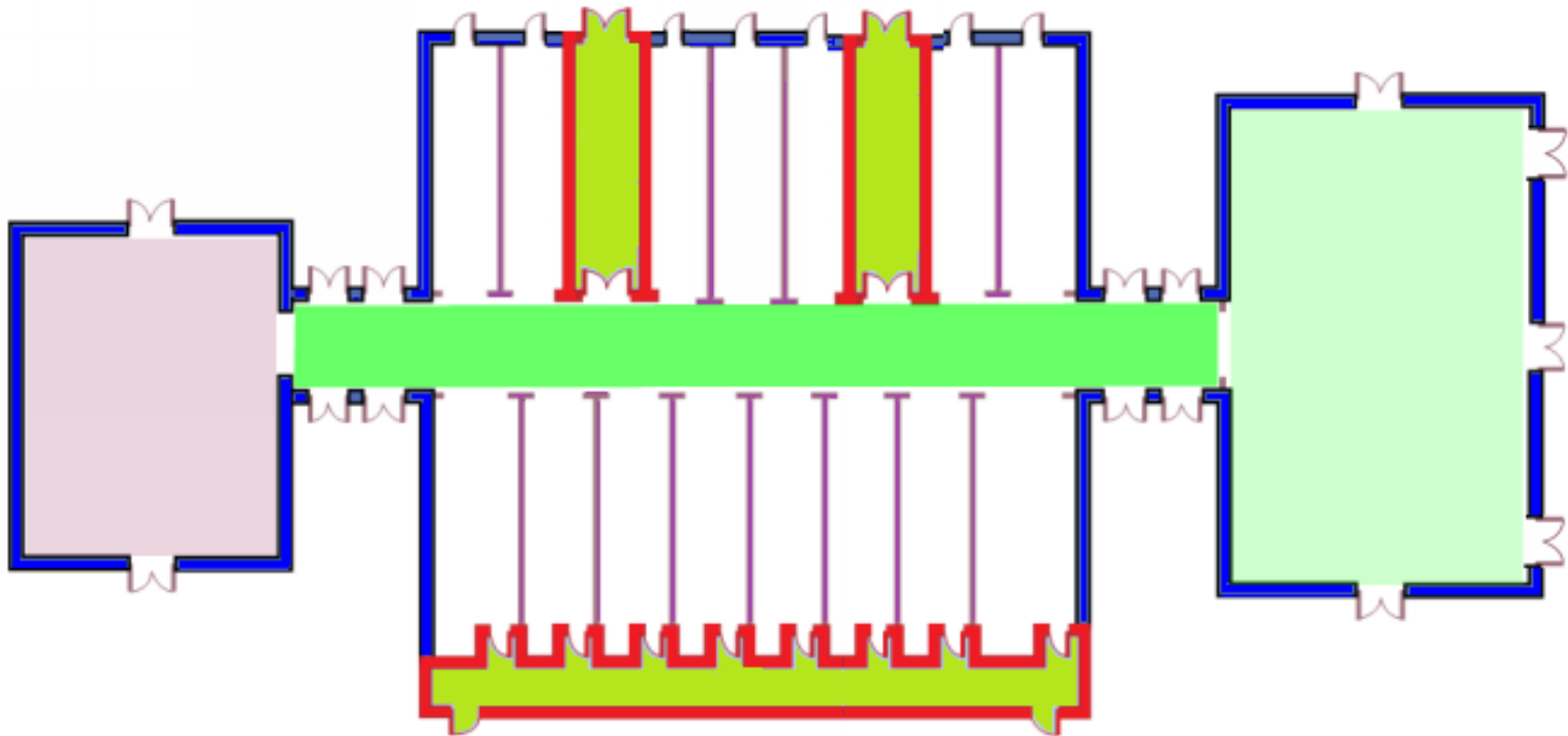
Mall Exit Assessment

- Total GLA (Determines Factor)
- Non GLA Calculated Separate
- Assess Individual Levels

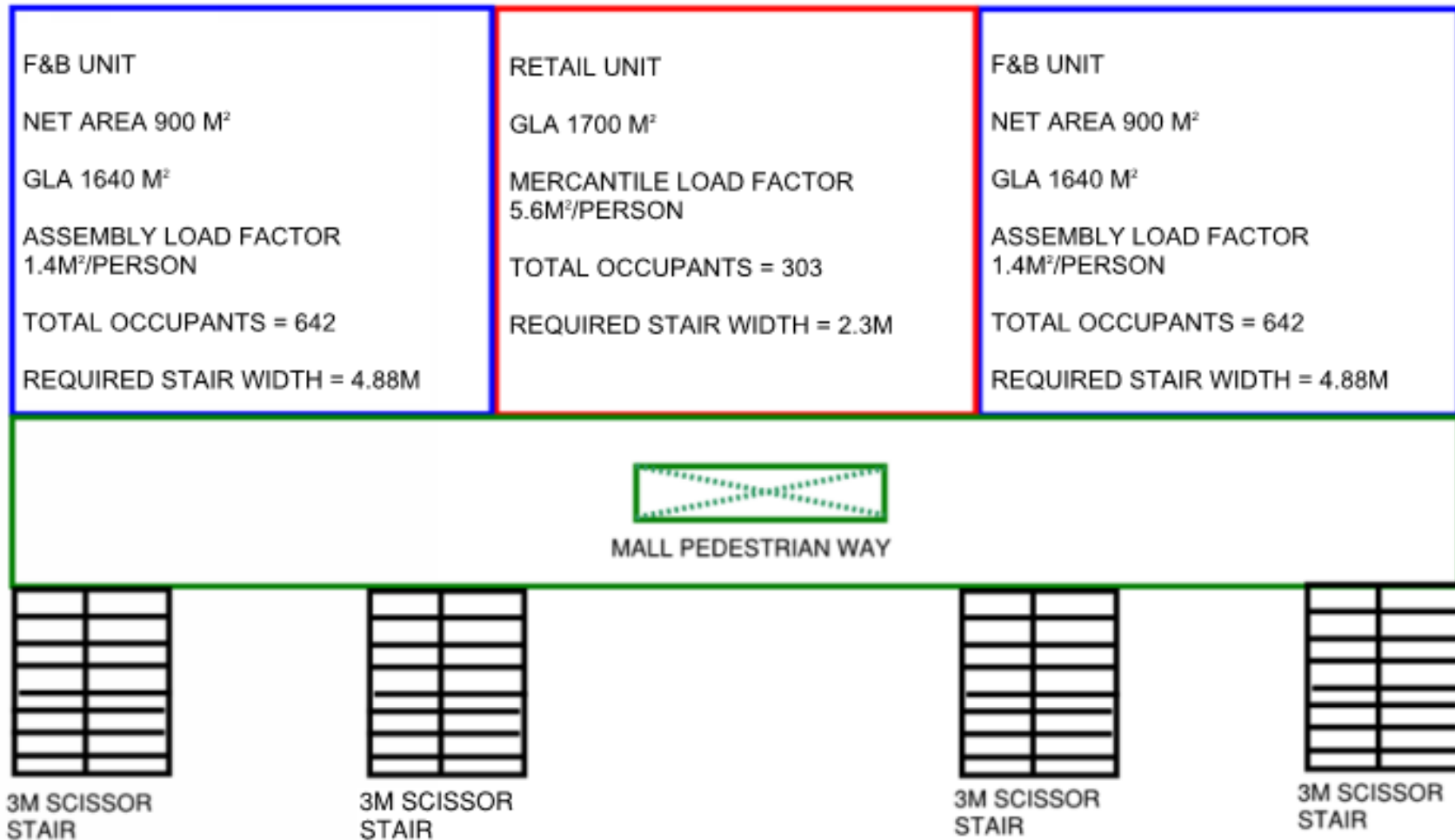
Individual Unit Egress Assessment

- Assembly - 1.4m²/person
- Retail (Ground) - 2.8 m²/person
- Retail (Upper Levels) - 5.6m²/person
- Storage - 27.9m²/person (UAE Fire Code)

A Typical Mall Building

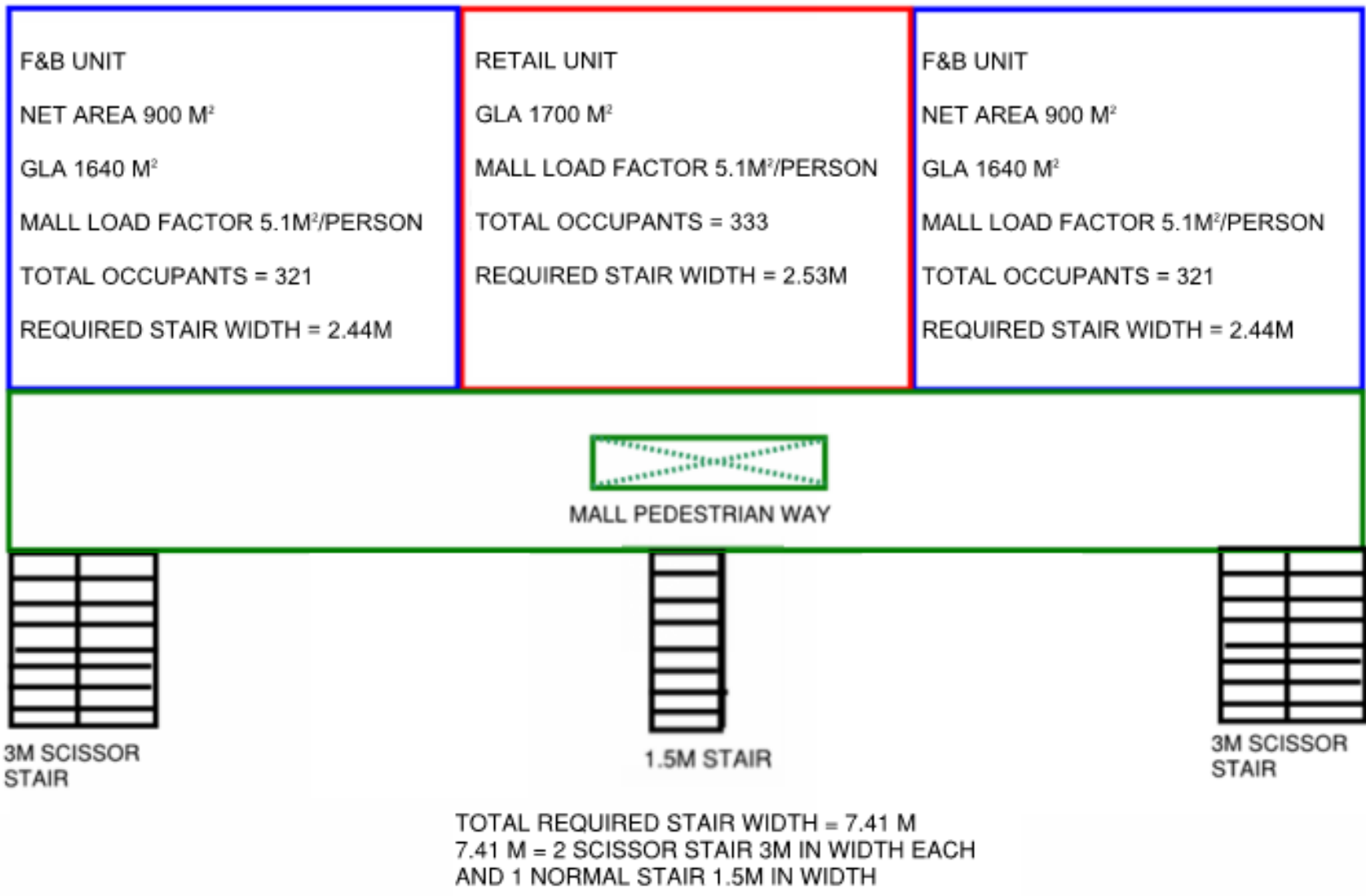


Exit Capacity – Base Factors



TOTAL REQUIRED STAIR WIDTH = 12 M
12 M = 4 SCISSOR STAIR 3M IN WIDTH EACH

Exit Capacity – Mall Factors



Unit Travel Distance



76m Internal Travel Distance

Mall Travel Distance



61m Mall Travel Distance

Based on Smoke Control Provisions

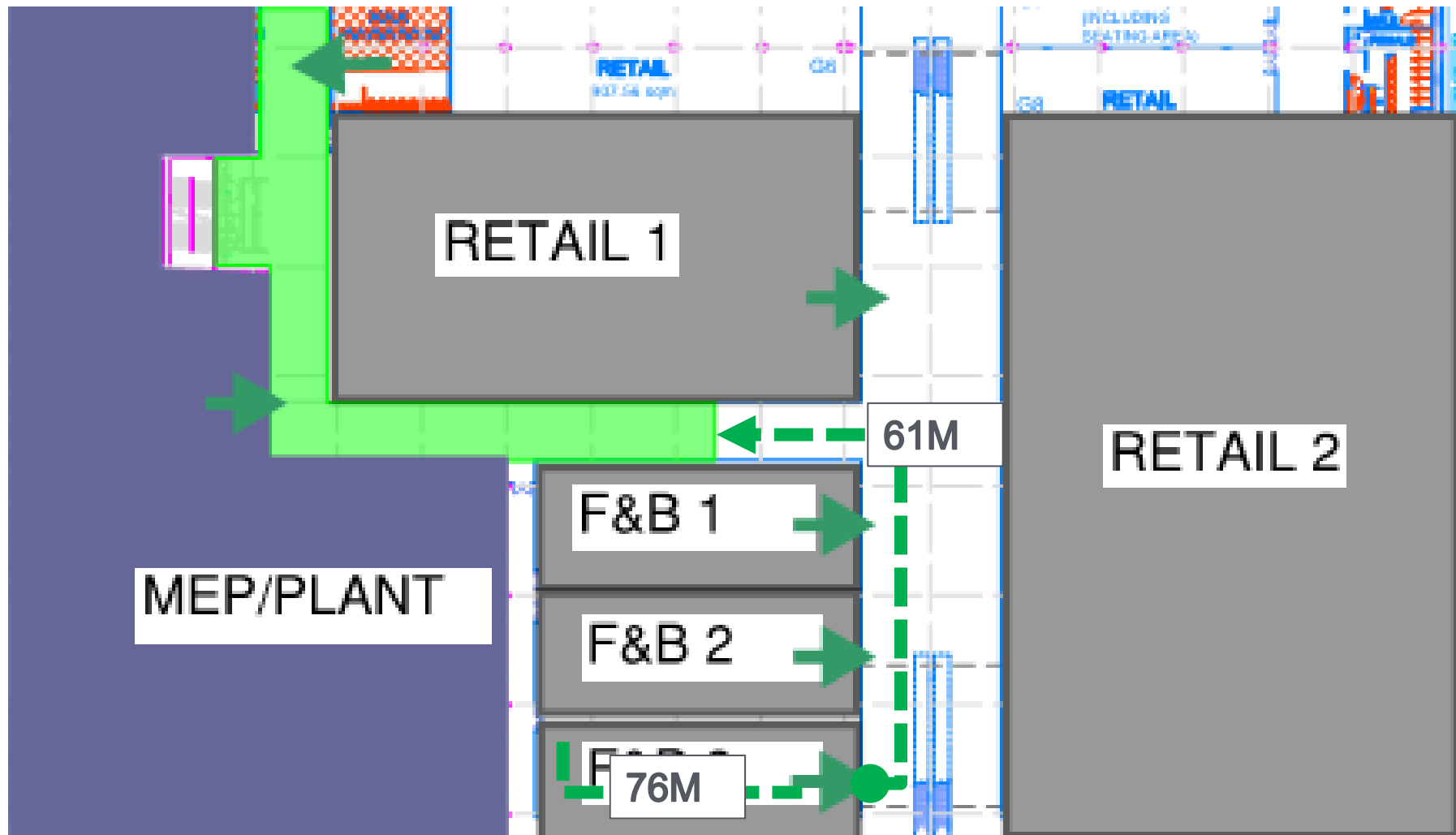
Mall Exit Passageways



Flexibility on Exit Passageways

Openings and Services Permitted

Mall Design Basics - Summary



Smoke Management - Mall

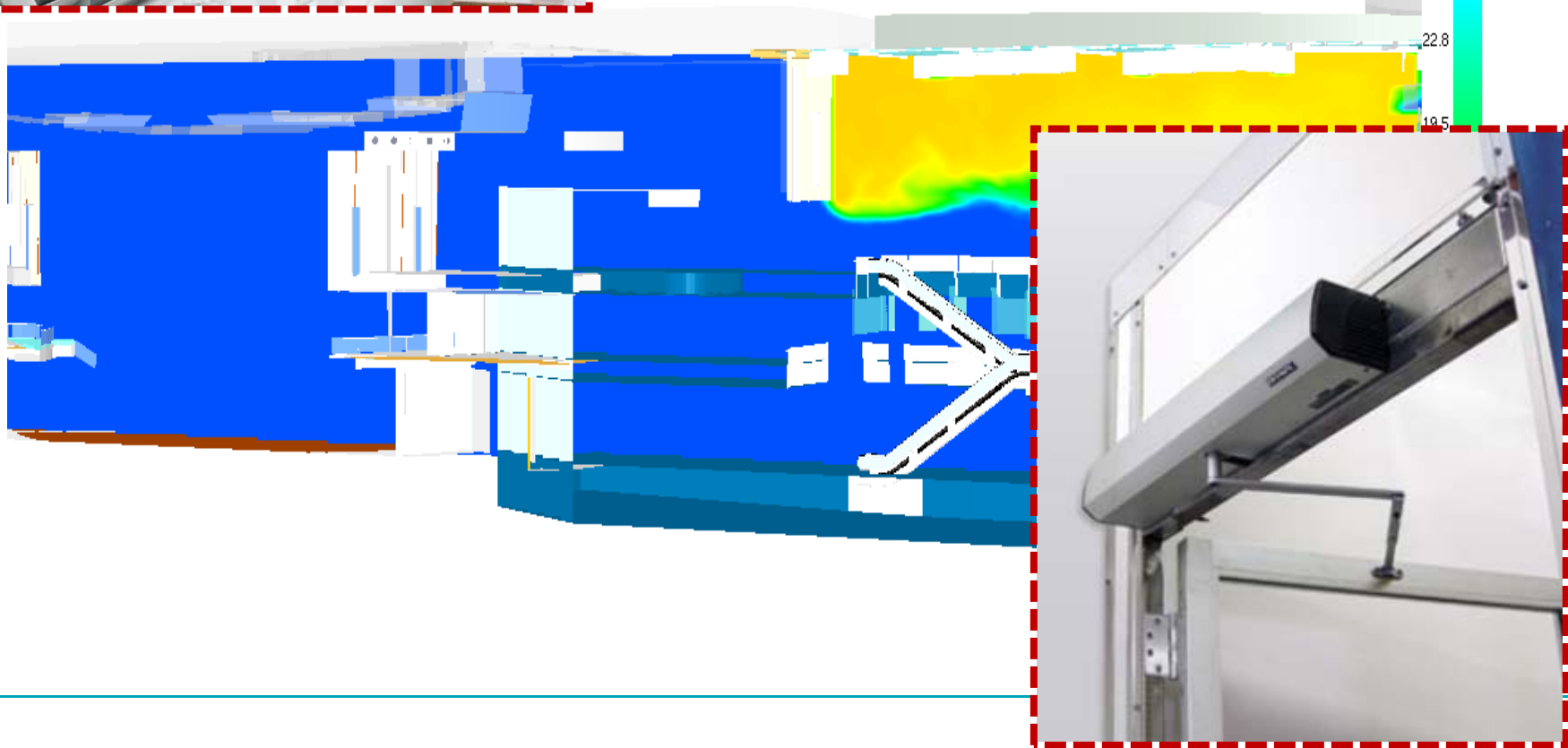


NFPA – Chapter 36 – MALL
CONNECTING MORE THAN 2 LEVELS

GENERAL LOCAL PRACTICE –
MINIMUM 6 AIR CHANGES



Smoke Management - Mall



Mall Expansion



Determine
Applicable
Code

Assess Impact
on existing
adjacent
structures

Treat as new
build where
feasible

Use existing
strategy where
available

Mall Expansion



Mall Refurbishment



Determine Original Strategy and Code

Assess Impact on existing adjacent structures

Use existing approved strategy where necessary, and achieve new code where practical

Coordinate interface with other engineering

Thank you

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