

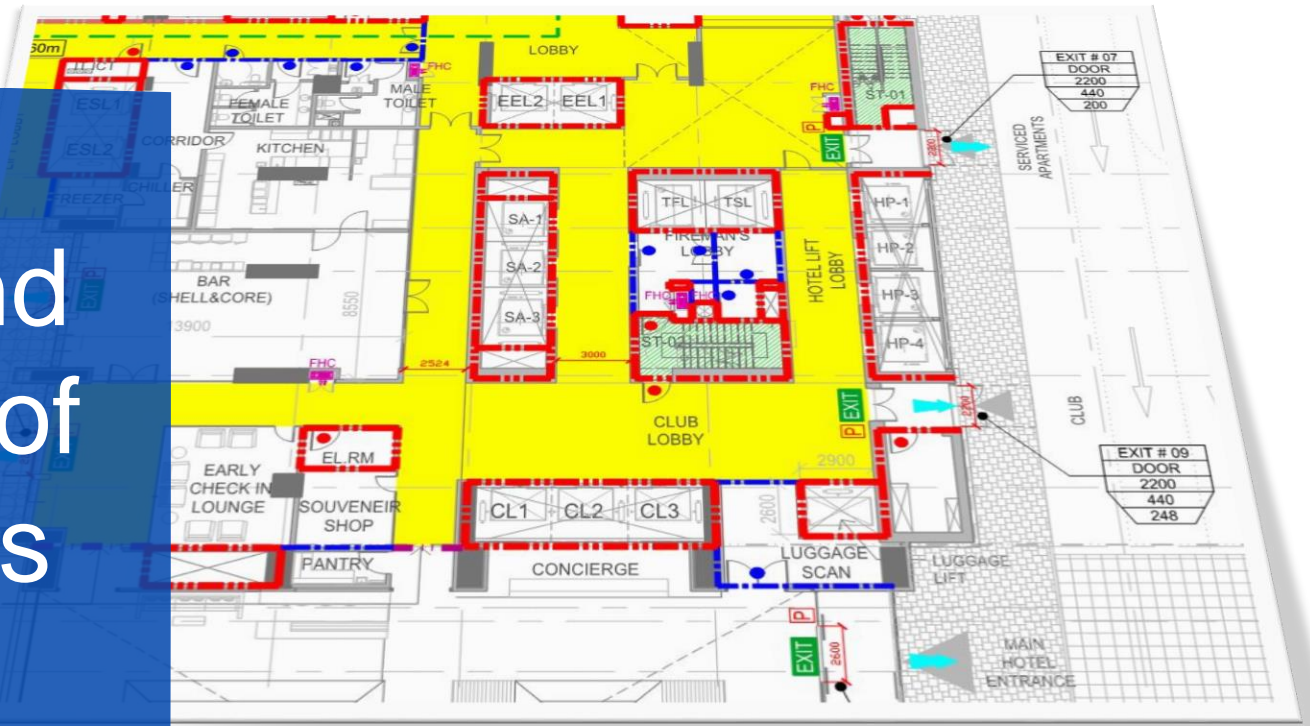


Cairo Conference

JW Marriott Hotel Cairo, Thursday, November 5, 2015

Integration and Coordination of Fire Strategies

Construction Phase





COURSE DESCRIPTION

Fire strategies are developed with varying degrees of information and detail for specific system requirements dependant on the type of project. Often times there will be a gap of information between the strategy, the design of the systems to meet the strategy, the installation of systems by the various contractors, and the actual operation and maintenance by the building operators. Some examples for fire safety systems include:

- Has there been coordination with the life safety and the other disciplines**
- Has that strategy been clearly written for the contractor to implement the strategy – example cause and effect strategy/matrix with associated strategy and intent**
- Was there coordination on site to validate between the associated disciplines**

Presenter

Alexander Castellanos

- University of Maryland, B.S. Fire Protection Engineering
 - 2004 – 2008, RJA New York
 - 2008 – 2010, Buro Happold London
 - 2010 – 2012, Buro Happold New York
 - 2012 – Present, WSP | Parsons Brinkerhoff UAE
-
- Experience in design of high profile, high occupancy buildings
 - Fire, Smoke, and egress modelling
 - Liaison with Approving Authorities

Learning Objectives

1. Fire and Life safety concepts summary
2. Key design aspects critical during construction
3. Coordination during construction

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).

FIRE AND LIFE SAFETY CONCEPTS - PROCESS

**Objective – Protect Life
Of Building Occupant**

Determine Basis of Design

- Codes and Standards
- Best Practice Engineering

Develop Fire Strategy

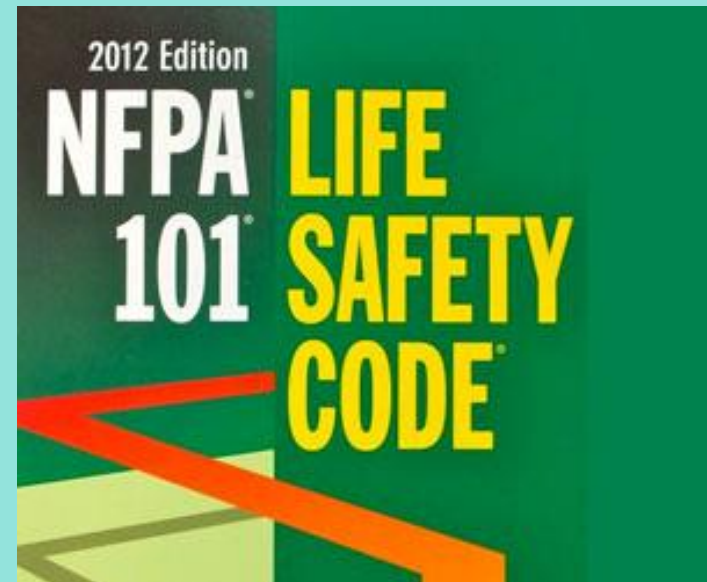
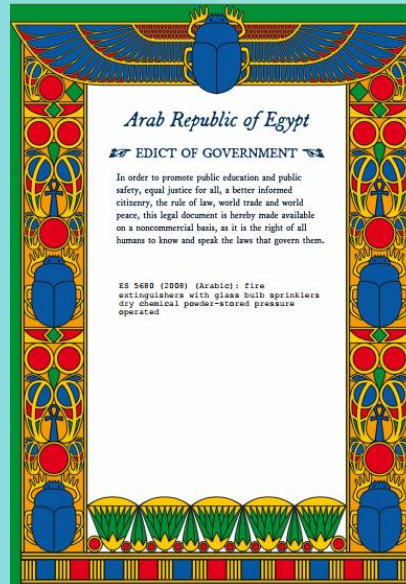
- Design Team Coordination
- Authority Approvals

Site Implementation

- Contractors
- Site Team

FIRE AND LIFE SAFETY CONCEPTS - GOVERNING CODES AND STANDARDS

- Local codes
- International codes
- Supporting standards
- Best practice



FIRE AND LIFE SAFETY CONCEPTS – FIRE RESISTANCE

- Structural resistance for stability during fire

Coordination:

- Architect
- Structural engineer

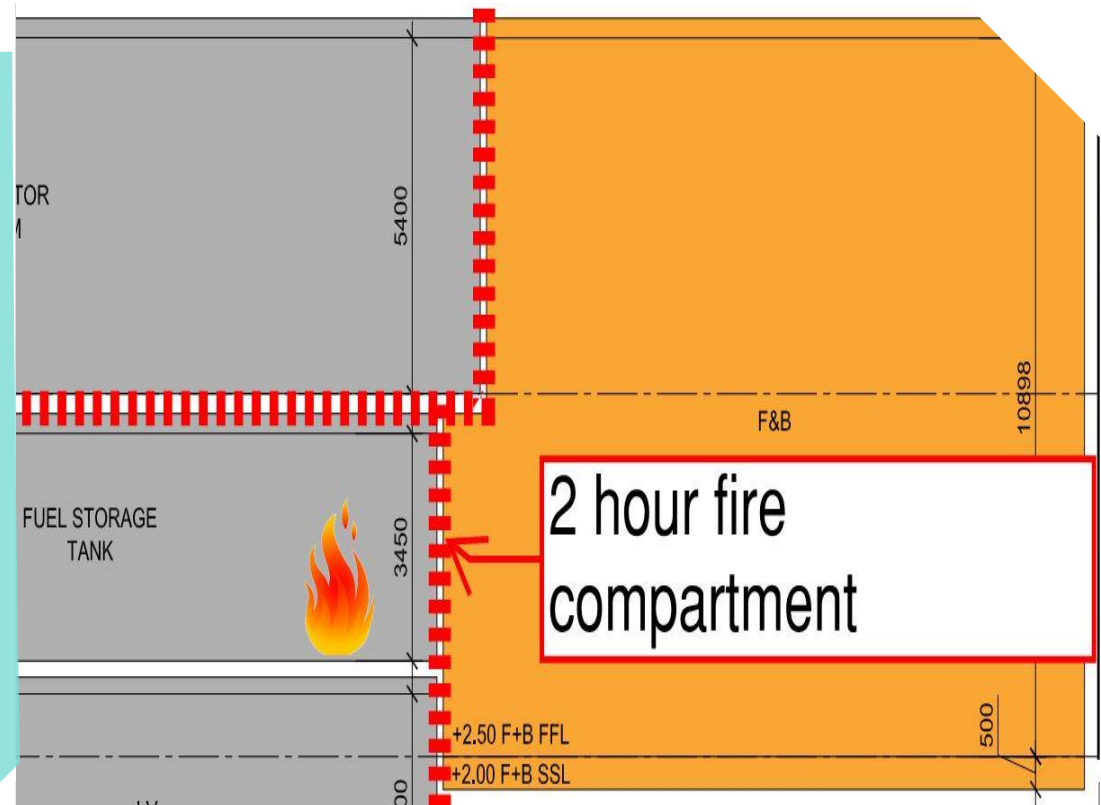


FIRE AND LIFE SAFETY CONCEPTS – FIRE RESISTANCE

→ Compartmentation to mitigate fire spread

Coordination:

- Architect
- Structural engineer
- *Mechanical engineer*
- *Plumbing Engineer*
- *Electrical Engineer*

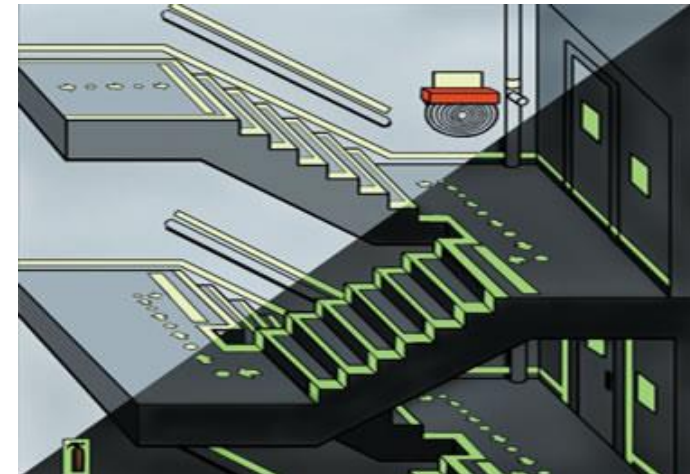


FIRE AND LIFE SAFETY CONCEPTS – MEANS OF EGRESS

→ Egress paths

Coordination:

→ Architect



FIRE AND LIFE SAFETY CONCEPTS – MEANS OF EGRESS

→ People and Capacity

Coordination:

→ Architect



FIRE AND LIFE SAFETY CONCEPTS – ACTIVE SYSTEMS

- Sprinklers and active suppression
- Fire Alarm
- Smoke control



Coordination:

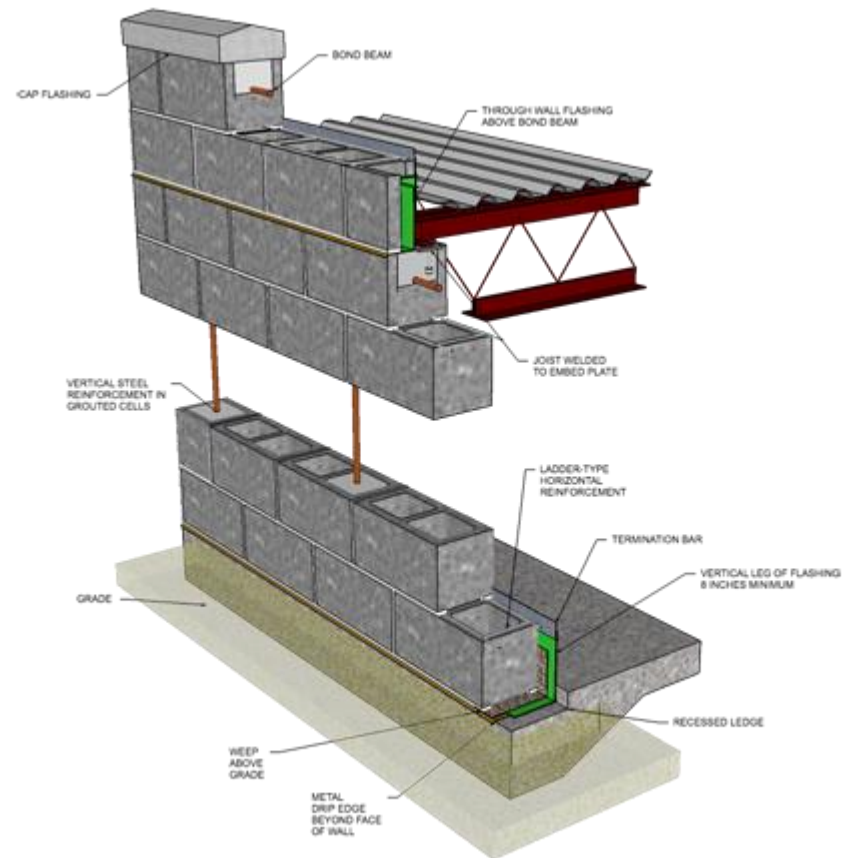
- Architect
- Fire Protection Engineer
- Electrical Engineer
- Mechanical Engineer

SITE COORDINATION

COORDINATION – COMPARTMENTATION

→ Fire strategy requirement for fire rated wall

What types of construction do you use, do you take advantage of inherent construction such as concrete walls



COORDINATION – COMPARTMENTATION

→ Fire strategy requirement for fire rated wall

Specification of gypsum board

The architect has to have a good understanding of their intent and input the fire strategy into their design



COORDINATION – COMPARTMENTATION

→ Fire stopping of penetrations

How do penetrations get addressed

A point which should have more focus during design

All disciplines involved should understand the number and types of penetrations



COORDINATION – COMPARTMENTATION

→ Fire stropping of penetrations

How do penetrations get addressed

A point which should have more focus during design



COORDINATION – COMPARTMENTATION

→ Fire stropping of penetrations

All disciplines involved should understand the number and types of penetrations



COORDINATION – FIRE ALARM

- Code or strategy requires manual or automatic fire alarm



COORDINATION – FIRE ALARM GENERAL

- Upon fire alarm activation occupants
- Occupants evacuate



COORDINATION – FIRE ALARM COMPLEX BUILDINGS

→ Upon fire alarm activation

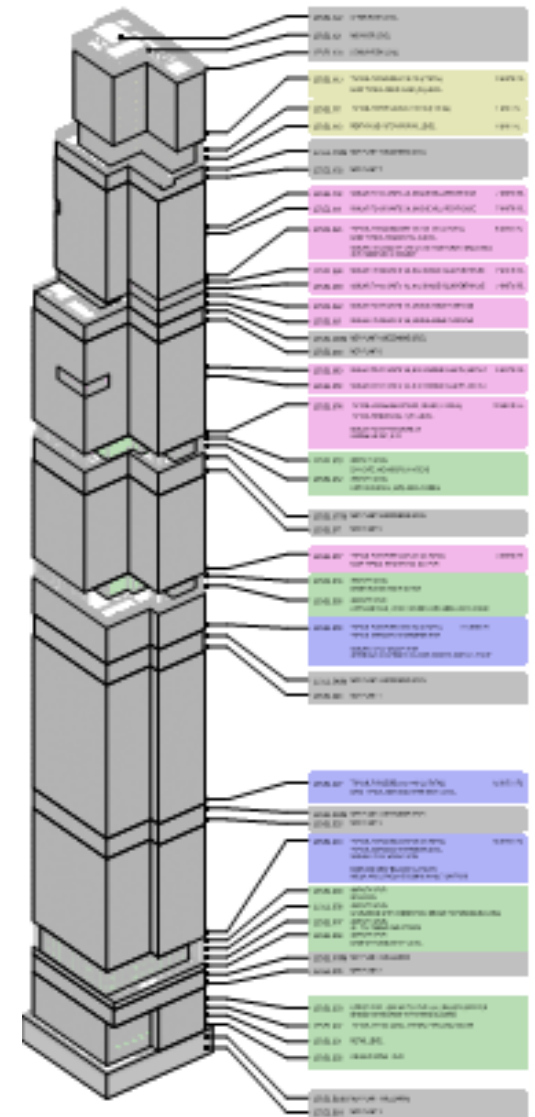
- Occupants evacuate
- Adjacent zones evacuate
- Smoke control system activates
- Doors open for make up air
- Ventilation system shuts down
- Fire shutters activate
- Any background music shuts off



COORDINATION – FIRE ALARM COMPLEX BUILDINGS

→ Upon fire alarm activation

- Occupants evacuate
- Floor above, floor below
- Shutdown of ventilation
- Notification



COORDINATION – FIRE ALARM COMPLEX BUILDINGS

→ Upon fire alarm activation

- Occupants evacuate
- Floor above, floor below
- Shutdown of ventilation
- Notification



COORDINATION – FIRE ALARM COMPLEX BUILDINGS

- Alarm Communication
 - Building Fire command center if available
 - Fire Department/ Civil Defence
 - Central Station (monitored location)



COORDINATION – FIRE ALARM COMPLEX BUILDINGS

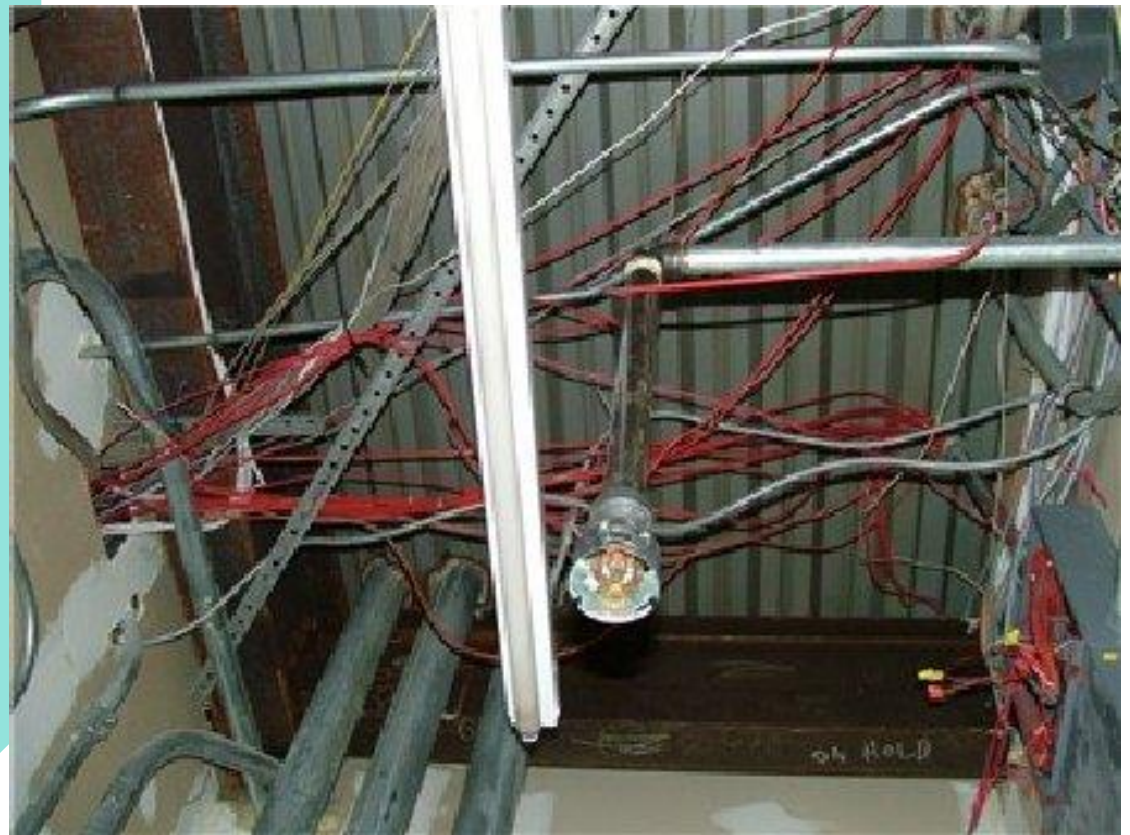
→ Fire Strategy

- Should include the cause and effect strategy
- Coordination with the design team
- Contractor develops matrix
- Design team reviews matrix

EFFECT CAUSE		Notification		SMS SYSTEM		LIFTS TO GROUND FLOOR, VAL OPEN, AND DISABLE		LIFTS TO BMS (Central Control Station)	
		Fire Indication on NFACP and Fire Computer in BMS Room	Voice Alert to Fire Affected Floor via Fire PAVA System	Standard Evacuation of Affected Area via Fire Alarm	Signal to DCD 24/7	Alarm to BMS (Central Control Station)	Alarm to BMS (Central Control Station)	Alarm to BMS (Central Control Station)	Alarm to BMS (Central Control Station)
CARPARK GENERAL AREA - ZONE 1									
MANUAL CALL POINT									
SPRINKLER FLOW SWITCH									
GAS LEAKAGE ALARM									
FIRE PUMP RUN									
CARPARK GENERAL AREA - ZONE 2									
MANUAL CALL POINT									
SPRINKLER FLOW SWITCH									
GAS LEAKAGE ALARM									
FIRE PUMP RUN									
CARPARK GENERAL AREA - ZONE 3									
MANUAL CALL POINT									
SPRINKLER FLOW SWITCH									
GAS LEAKAGE ALARM									
FIRE PUMP RUN									
GENERATOR ROOM - A									
HEAT DETECTOR ALARM									
FOAM SYSTEM RELEASE									
GENERATOR ROOM - B									
HEAT DETECTOR ALARM									
FOAM SYSTEM RELEASE									
GENERATOR ROOM - C									
HEAT DETECTOR ALARM									
FOAM SYSTEM RELEASE									
GENERATOR ROOM - D									
HEAT DETECTOR ALARM									
FOAM SYSTEM RELEASE									
DATA CENTER FM-200									
HEAT DETECTOR ALARM									
GAS RELEASE									
UPS ROOM FM-200									
HEAT DETECTOR ALARM									
GAS RELEASE									
MEDIA ROOM FM-200									
HEAT DETECTOR ALARM									
GAS RELEASE									
SECURITY EQUIPMENT ROOM FM-200									
HEAT DETECTOR ALARM									
GAS RELEASE									
NETWORK OPERATION ROOM FM-200									
HEAT DETECTOR ALARM									
GAS RELEASE									
LV ROOM A FM-200									
HEAT DETECTOR ALARM									
GAS RELEASE									
LV ROOM B FM-200									
HEAT DETECTOR ALARM									
GAS RELEASE									
LV ROOM C FM-200									
HEAT DETECTOR ALARM									
GAS RELEASE									
LV ROOM D FM-200									
HEAT DETECTOR ALARM									

COORDINATION – FIRE SYSTEMS AND SERVICES COORDINATION

- Installation
 - Sensitive components and cables
 - Installation sequence to mitigate potential damage from other system installs



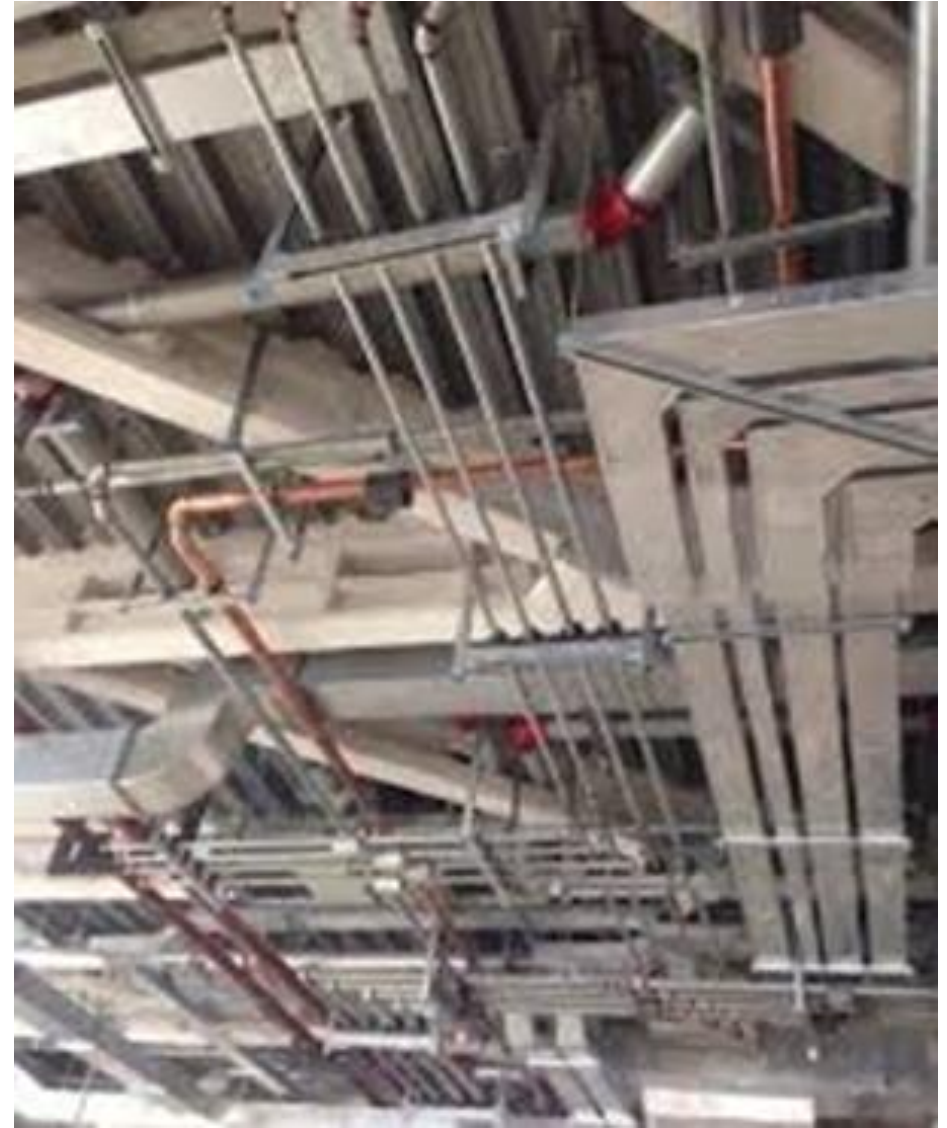
COORDINATION – FIRE SYSTEMS AND SERVICES COORDINATION

- Building services coordination
- Design drawings not fully coordinated
- Last items to be installed are sprinklers and other systems
- Lack of space for fire systems which need to be prioritized
- Ensure during the design that as a minimum, fire services routing is understood



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SUMMARY

- **Fire strategies should be coordinated during design with each discipline**
- **It is beneficial to identify from the start which disciplines are affected by the fire strategy**
- **Systems designers should prioritize space planning for fire systems**
- **For complex buildings, it is in the best interest of the project to maintain a fire consultant during construction**