CONSTRUCTION WITHOUT OVERSIGHT

Douglas H. Evans, P.E., FSFPE
DHE FPE LLC
Las Vegas, NV
Learning goals

• Building Code requirements to limit fire and smoke propagation.

• Building Code requirements for occupant safety.

• Passive containment and protection of building components is pertinent even in fully sprinklered buildings.

• Constant oversight by qualified individuals is vital to help ensure life safety and property protection.

• Enforcement is a necessity in today’s society.
Overview

In 2008, Clark County Building Department instituted a rigorous inspections program to uncover unreported building code violations in the existing resorts on the world-famous Las Vegas Strip. The violations discovered were primarily due to substantial work conducted without permits or inspections and inadequate or improper maintenance. An overview of the various types of violations and their extent will be discussed.

www.clarkcountynv.gov
• 22.02.050 Existing Occupancy.

• 22.02.055 Maintenance.

All buildings, structures, pools, spas, signs, and building service equipment, existing and new, and all parts thereof shall be maintained in a safe condition. All devices or safeguards which are required by the technical codes shall be maintained in conformance with the technical code under which installed. The owner or designated agent shall be responsible for the maintenance of buildings, structures, pools, spas, signs and their building service equipment. To determine compliance with this subsection, the Building Official may cause any structure to be re-inspected.
Licensed Resort Hotel
Periodic Inspection

(1) General. Buildings licensed as a business under Clark County Code Title 30 as a Resort Hotel shall be subject to periodic inspections to review existing building conditions and maintenance for building code safety compliance. The periodic inspection shall be performed no more than once a year. The inspection shall include all areas within the resort hotel, including but not limited to guestrooms, corridors, service areas, stairways, kitchens, dining areas, bars, casino areas, offices, stages and showrooms. Guestrooms will be inspected on each floor of each hotel, with a minimum of twenty percent of the total guestrooms to be inspected. Discrepancies noted during the inspection shall be submitted via written report to the property owner with a designated time frame for correction. Discrepancies requiring an applicable building permit shall be so noted. Failure to correct discrepancies within the designated time frame may result in issuance of a misdemeanor citation and/or revocation of the Certificate of Occupancy.
Combustible Construction in Non-Combustible Buildings
Wood room constructed for comm equipment w/o permits. Basement HK storage area.
Combustibles in Plenums
STRUCTURAL MODIFICATIONS
2018 IBC SECTION 1705
REQUIRED SPECIAL INSPECTIONS AND TESTS

• **1705.14 Sprayed fire-resistant materials.**
  – 1705.14.1 Physical and visual tests.
  – 1705.14.2 Structural member surface conditions.
  – 1705.14.4 Thickness.
  – 1705.14.5 Density.
  – 1705.14.6 Bond strength.

• **1705.15 Mastic and intumescent fire-resistant coatings.**
  – *Special inspections* and tests ... shall be performed in accordance with AWCI 12-B.
Egress Violations
IBC Chapter 10
THINK
SAFETY IS EVERYONE'S JOB
OPENING PROTECTIVES
IBC SECTION 716

- Fire-resistance-rated glazing
- Fire-protection-rated glazing
- Fire door assemblies
WALL INSTALLATION ONLY
Electrical Violations
Plumbing Violations
SHAFT ENCLOSURES
IBC SECTION 713

Required to protect openings and penetrations through floor/ceiling and roof/ceiling assemblies.
PENETRATIONS
IBC Section 714

• Fire-resistance-rated walls (IBC 714.4)
• Horizontal assemblies (floor/ceiling) (IBC 714.5)
• Smoke Barriers (IBC 714.5.4)
  – Membrane penetrations
  – Through penetrations
IBC SECTION 1705
REQUIRED SPECIAL INSPECTIONS AND TESTS

• 1705.17 Fire-resistant penetrations and joints.
  – In high-rise buildings or in buildings assigned to Risk Category III or IV, special inspections for through-penetrations, membrane penetration firestops, fire-resistant joint systems and perimeter fire barrier systems that are tested and listed in accordance with Sections 714.4.1.2, 714.5.1.2, 715.3 and 715.4 shall be in accordance with Section 1705.17.1 or 1705.17.2.
  
  – 1705.17.1 Penetration firestops.
    • in accordance with ASTM E2174

  – 1705.17.2 Fire-resistant joint systems.
    • in accordance with ASTM E2393.
FIRE-RESISTANT JOINT SYSTEMS
IBC SECTION 715

Joints installed in or between fire-resistance rated walls, floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies shall be protected by an approved fire-resistant joint system designed to resist the passage of fire for a time period not less than the required fire-resistance rating of the wall, floor or roof in or between which it is installed.
DUCTS AND AIR TRANSFER OPENINGS
IBC SECTION 717

• Fire dampers
• Smoke dampers
• Combination fire/smoke dampers
• Ceiling radiation dampers
Summary

- Certain Building Code requirements are intended to limit fire and smoke propagation.
- Certain Building Code requirements are for occupant safety.
- Passive containment and protection of building components is pertinent even in fully sprinklered buildings.
- Constant oversight by qualified individuals is vital to help ensure life safety and property protection.
- Enforcement is a necessity in today’s society.
High-Rise Façade Fires
A World Wide Concern
24-storey Grenfell Tower in Kensington, West London
June 14, 2017
72 lives lost
Notable Losses

- Torch Tower Dubai
  - February 2015 and again, August 2017 Aluminum Composite Panels (ACPs)
- Baku, Azerbaijan, May 19, 2015
  - 15 deaths; 63 injured
- The Address Downtown Dubai Hotel
  - New Year’s Eva 2015 ACPs
- Polat Tower, Istanbul, Turkey, July 17, 2012
  - Fire started by faulty air conditioning unit
- Al Tayer Tower, UAE April 28, 2012
  - ACPs Ignited by cigarette butt
- The Monte Carlo Hotel Tower
  - Las Vegas, NV January 25, 2008
- Water Club Tower at the Borgata Casino hotel
  - Atlantic City, September 23, 2007
  - ACPs with polyethylene core
- And many more.....
- Additional Countries impacted
  - China, Australia, New Zealand, Hungary, Scotland, Germany, Russia, France, South Korea, Canada, India, Spain, Qatar, ...
MECHANISMS OF FIRE SPREAD

Edge of slab protection contributing issue.
NFPA 285 – Test Apparatus

- Does not include slab edge testing
Questions?

Douglas H. Evans, P.E., FSFPE
DHE FPE LLC
Las Vegas, NV