



JENSEN HUGHES

Advancing the Science of Safety

FIRE ALARM SYSTEMS & 780 CMR

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BIOGRAPHY

David J. LeBlanc, PE, FSFPE

- BS EE & MS FPE - WPI
- 23 Years
- PE
- Technical Committee Member
 - NFPA72 - National Fire Alarm Code
 - NFPA3 – Commissioning of Fire Protection and Life Safety Systems
 - NFPA4 – Integrated Testing of Fire Protection and Life Safety Systems
- Vice Chairman – BBRS Fire Prevention Fire Protection
- Fellow SFPE
- VP



OVERVIEW

Fire Alarm Systems

- Codes & Standards
- Documentation
- Characteristics of Systems
- Other Items
- Questions



CODES & STANDARDS

Inter-Relationship of Codes

- MSBC 8th Edition
 - WHEN fire alarm systems are required
- NFPA72 2010 Edition
 - HOW to put in the fire alarm system
- Reference to NFPA 1 (State Fire Code) (907.8)
 - Inspection, Maintenance, and Periodic Testing



CODES & STANDARDS

MSBC (780 CMR) 8th Edition

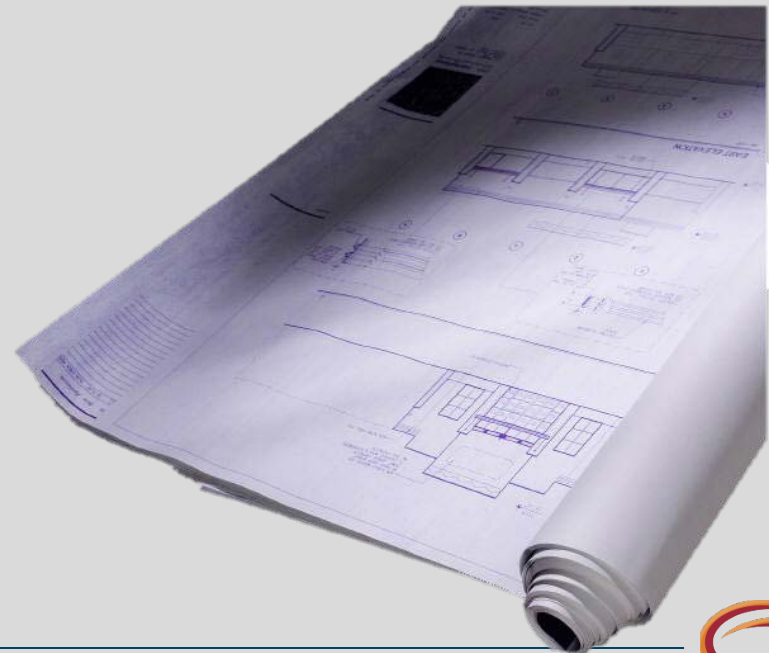
- Based on 2009 Edition International Building Code (IBC)
- MA specific amendments
 - Alternative designs require independent 3rd party P.E. review
 - Owner's cost and responsibility
 - Written report to building official
 - Application for variance submitted to SBC Appeals Board



DOCUMENTATION

Document Submittal Process (901.2.1 & 907.1.2)

- Tier 1 – Construction Documents
 - Narrative report
 - Systems information – fire alarm, fire protection, etc.
- Tier 2 – Shop Drawings
 - Detailed design layout
 - Sequence of Operation
 - Name, License #, exp. date
- Tier 3 – Record Drawings
 - As-Built documentation



DOCUMENTATION

Certificate of Occupancy (901.5.1)

- Certification from P.E. (Engineer of Record)
- Confirmation by Owner that As-Builts have been received
- NFPA Standards completion Certificates
- Acceptance Test
 - In the presence of building official and/or fire official
- In lieu of witness testing – may accept final performance test report from P.E.



CHARACTERISTICS OF SYSTEMS

Sprinkler Alarm Monitoring

- Performed by Fire Alarm (907) but in Sprinkler (903.4.1)
 - Central Supervising Station
 - Proprietary Supervising Station
 - Auxiliary Fire Alarm System or constantly attended location approved by Fire Department



CHARACTERISTICS OF SYSTEMS

Fire Alarm Systems

- When required – Section 907
- Manual Fire Alarm Systems
 - Pull Stations
- Automatic Fire Alarm Systems
 - Sprinkler Water-flow
 - Smoke Detectors
 - Heat Detectors



CHARACTERISTICS OF SYSTEMS

Fire Alarm Systems

- Occupancy will determine which type of system is required and to the extent
- Nightclub A-2 (907.2.1.2)
 - Bring up house lighting
 - Stop distractive lighting (disco ball, etc.)
 - Stop all sounds



CHARACTERISTICS OF SYSTEMS



Fire Alarm Systems – Audible Types

- Non-Voice
- Emergency Voice Systems
 - Large assembly, High-Rise, Atriums
 - Intelligible – performance based design
 - Acoustically Distinguishable Space (ADS)
 - Covered in Basis of Design (Narrative)
 - Approved by local authority
 - Not all rooms require intelligibility
 - Individual offices
 - Mechanical rooms



VOICE INTELLIGIBILITY

- NFPA 72 – Audibility and Intelligibility
- Lack of understanding
- Beyond sound level above ambient noise
- Can you understand the words
- More speakers at lower wattage taps
- Voice Intelligibility Meter (CIS -.70)



CHARACTERISTICS OF SYSTEMS

Fire Alarm Systems – Types (cont.)

- Partial Evacuation Buildings
 - High Rise
 - Hospitals
 - Prisons
 - Requires survivability
 - CI, MI, 2 hour rated cable
 - Fire Fighter Jacks/Phones
 - Survivability Level 2 Notification circuits thru other notification zones



CHARACTERISTICS OF SYSTEMS

Fire Alarm Systems - Details

- Spacing per NFPA72
 - Smoke Detectors
 - Heat Detectors
 - Visual Notification Appliances (Strobes)
 - General Prescriptive coverage
 - Candela Ratings
 - Room Coverage
 - Corridor Coverage
 - Performance Based Approach



PATHWAY (CIRCUITS)

Pathway Class Defined By Performance

- Class B – No redundant path & fails with open or short & faults monitored
- Class A – Redundant path & fails with a single short & faults monitored
- Class X – Redundant path & does not fail with a single open or short & faults monitored
- Redundant Path (4 Ft Horizontal & 1 Ft Vertically)



CHARACTERISTICS OF SYSTEMS

Renovation, Upgrades, System Replacement

◉ Chapter 34

- Analysis required
- Identifies code path for compliance of proposed work
- Even if just Fire Alarm Replacement or Upgrade
- Total upgrades with new brain & new program new code



OTHER ITEMS

Not Always Utilized But Should

- Hazmat Report
 - Building official can require by qualified firm approved by AHJ
- Smoke Control Special Inspector
 - Section 909 for smoke control systems
- 3rd party review of any smoke control system (909.2)
 - System designs incorporating performance analysis
 - System designs using smoke control methods
 - Alternative design method selected by registered design professional



QUESTIONS?

Contact

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