Fire Alarm Installation

Placement, Operation and Documentation
What we will cover

- **Placement**
  - Control Equipment
  - Initiating Devices
  - Notification Devices
  - Ancillary Functions

- **Operation**
  - Alarm, Trouble and Supervisory
  - CBE (Gen. Alarm, by Floor, by Evacuation Zone, Smoke Control Doors, etc.)

- **Documentation**
  - Sequence of Operation (Narrative)
  - Contract Documents
  - Shop Drawings / submittals
  - Record of completion & Commissioning Test
  - Site Specific Software
  - Inspection, Testing & Maintenance
Placement

- Control panels
  - Height from the floor not generally mandated unless the system annunciator is enclosed
    - Should be discussed with the AHJ
    - Clearly visible and at a height as to be viewed easily (LCD or LED)
    - If it contains controls then ease of access is imperative
  - 3 Foot area in front of controls for operating personnel is generally acceptable
  - If behind closed doors, door must be marked “FIRE ALARM CONTROL” Various Municipalities will modify this.
  - Smoke detector must be mounted above “all” (not continuously occupied)
    - Control Panels
    - Power Boosters
    - Supervisory Station Transmission Equip.
Placement

- Annunciators
  - Clearly visible and at a height as to be viewed easily (LCD or LED)
  - If it contains controls then ease of access is imperative
  - Can have system controls that must not be password protected
    - Alarm Silence
    - Reset
    - All other CBE functions may be password protected
  - Graphics must have “YOU ARE HERE”, show North and be of the proper orientation so as to not confuse or delay fire fighting efforts. Consult with AHJ.
Placement

● Pulls
  ○ Wall mounted, conspicuous, unobstructed and accessible...
  ○ 42 - 48 inches off the floor (to the operable part of the station
    ■ Forward reach from a chair 48 inches, side reach from a chair 54 inches
  ○ Within 60 inches (5 feet) of an exit and on both side of a “grouped opening” over 40 feet
  ○ No more than 200 feet of travel between stations
  ○ Mounted on a contrasting color
    ■ Code states they must be red unless mounted in a red environment
    ■ No optional color is offered, must consult the AHJ
  ○ Stations connected to a Local System must be marked to warn that the station will not contact any outside agency
Placement

- Smokes
  - 30 foot centers for normal ceilings
  - Different spacing for different applications (must include a knowledge of the fire load as well as the speed the smoke will reach the detection):
    - Peaked, within 36 inches of the peak (A17.6.3.4 a&b)
    - Beam, 18 inch beam & 8 feet of separation between beams = Separate Space
    - Beam, 12 inch beam & < 8 feet separation = Detector may be mounted on beam
  - Photos see visible smoke (cold smoldering) vs Ions smell gases (hot fire)
- Duct Detector Installation
  - Mount upstream between the last inlet or outlet before the damper
  - Mount downstream between the last inlet or outlet before the damper
- Co Detector installation
Placement

- Heats
  - Fixed Temp Trips at predesigned temperature (135, 190…)
  - Fixed/ROR (12 degree rise in 12 - 15 seconds)
  - Rate Compensating Maintains exact Temp threshold regardless of fire intensity
- Spacing
  - Changes with ceiling height and type
  - Table NFPA 72 2013 A.17.6.3.1.1
Placement

- **Horns**
  - 15 dba above ambient (see NFPA 72 2013, Table A.18.4.3 for ambient noise levels)
  - Max db loss (double the distance = lose 6 dba)
  - Height 90 inches
  - Sync temporal 3 (4’s for CO)
  - High vs Low Frequency (low frequency has been proven to be 4-12 times more effective in waking the hard of hearing and the intoxicated)

- **Strobes**
  - Height 80 - 96 inches
  - Ceiling vs Wall vs Candella (visible appliances in public mode located and of a type and size and number so that their operating effect is see regardless of the viewer’s orientation)
  - Synchronizing
Placement

- **Speakers**
  - 15 dba above ambient (see NFPA 72 2013, Table A.18.4.3 for ambient noise levels)
  - Max db loss (double the distance = lose 6 dba)
  - Height 90 inches
  - Audio Programming
    - Fire Floor, Floor Above, Floor Below (2 Above, etc…)
    - Relocation based vs Area of Refuge
    - Evacuation Zones
Operation

● System Functions
  ○ Alarm Signals
  ○ Trouble Signals
  ○ Supervisory Signals

● Manual Control Functions (relays operating dampers, Door Holders, Elevator recall, Smoke Control, etc...)

● Control By Event
Documentation

● What all is required and who is responsible for it...
  ○ Supplied by the Installing Contractor (Submittals)
    ■ Narrative, Riser Diagram, Floor Plan, Manufacturer’s Data Sheets, Manufacturer’s Installation Sheets, Battery Calcs, Voltage Drops, Mounting Heights of Notification Appliances.
  ○ Created by the Installing Contractor
    ■ Record of Completion (goes on to be a living document that is updated as the building system is updated)
      ● Maybe filled out by multiple entities
    ■ Site Specific Software
      ● To include system and software passwords and kept on site
    ■ As-Built Drawings
    ■ Inspection and Test Records (NFPA 72 2013 Chapter 14)
Let’s talk

- Questions?
- Field issues?
- What’s next in this series of Fire Alarm Tech Presentations