

1 General

.1 Fire Alarm System Requirements

- .a Where future expansion is planned in the initial design of a facility the Engineer shall provide adequate additional capacity and connection points in the electrical design. The additional capacity shall be clearly noted in the equipment schedules.
- .b All points for future connections shall be clearly shown and labeled on the drawings with the capacity (Kw, etc.) that is available at each connection point.
- .c The contractor shall provide all power wiring to each piece of mechanical equipment. The mechanical contractor shall furnish all starters and disconnects to turn over to the electrical contractor. Mechanical contractor is to make final connection to each piece of mechanical equipment.
- .d Engraved laminated labels shall be provided on all electrical equipment, panels, main distribution panels, and transformers.
- .e Junction boxes and conduit shall be color coded as indicated in the Wake County Conduit and Box Color Chart in Division 26.
- .f Equipment name plates (metal preferred) with raised or depressed images for permanent attachment shall list the following:
 - 1. Manufacturer, product name, model number, and serial number.
 - 2. Capacity, operating and power characteristics, and essential data
 - 3. Labels of tested compliances.
- .g Minimum conduit size shall be $\frac{3}{4}$ " and all conduit runs shall include pull string. Conduits shall use compression fittings only. Screw fittings are not acceptable. Conduit shall be installed parallel to or at right angles to beams, wall, or, ceilings, or floors. Reference Division 26, Electrical.
- .h Cables may not be spliced.
- .i Any cables exposed in finished areas where suspended ceilings are not planned shall be installed in raceways.
- .j Install a minimum of two vertical cable risers to serve the fire alarm system. Separate risers with a minimum of a one-hour rated wall or enclosure shall be provided.
- .k All wiring connections shall be made with approved crimp-on terminal space lugs, pressure type terminal blocks, or plug connectors.
- .l Color-coded fire alarm conductors shall be provided. Alarm circuit, supervisory circuits, normal power wiring, audible alarm-indicating devices, and visible alarm-indicating devices shall have different color coded wiring.
- .m Fire alarm circuits and equipment control wiring associated with the fire alarm system shall be installed in a dedicated raceway system.
- .n Identify system components, wiring, and cabling complying with TIA/EIA-606-A.
- .o Provide two sets of contacts, one for alarm and one for trouble to tie into security system.
- .p All connections at the FACP must be made by the Manufacturer's authorized, factory trained representative.
- .q All Life Safety Devices shall be red.
- .r Adhere to Wake County convention standard.
- .s Fire alarm system shall override security system.
- .t Where smoke control systems are installed, fire alarms systems shall integrate and communicate with the BMS to control the smoke control system.

.2 Security System Requirements:

- .a Where future expansion is planned in the initial design of a facility the Engineer shall provide adequate additional capacity and connection points in the electrical design. The additional capacity shall be clearly noted in the equipment schedules.

- .b All points for future connections shall be clearly shown and labeled on the drawings with the capacity that is available at each connection point.
- .c All cable shall be in conduit. No plenum rated cable shall be used. Provide cabling for each security device as recommended by the manufacturer of the security equipment.
- .d Control panels shall be mounted 5'-0" above finished floor. Control panels shall be installed in the Telco/IDF room and the location shall be coordinated with the owner and the IT department prior to installation. Conduits may be exposed in these locations only.
- .e All keypads, card readers, duress buttons, door position switches, motion detectors, Knox Box tamper monitoring, security intercoms and cameras shall be homeruns to main panel. No splices in cabling data loops will be accepted.
- .f Each motion detector, duress button, door position switch, card reader, and other alarm initiating devices shall be individually zoned.
- .g No splices in conductors shall be permitted at any point in this system.
- .h Provide single gang boxes for motion detectors and single gang boxes for keypads.
- .i The main security alarm panel for each site requires a dedicated communication line. Consult with the owner on type line required.
- .j Each security intercom and emergency blue light phone requires a dedicated phone line or com. link. There shall be at least one intercom at the employee entrance to the building.
- .k Door frames shall be prepped at the factory for conduit connections for the electric transfer device and the door position switch on the card reader doors and door position switches on non-card reader doors.
- .l Electrified door hardware for card reader doors shall be 24 VDC with the RX (Request to exit) option. Card reader doors that require panic devices shall have electrified panic hardware. All card reader doors shall have electric transfer devices on the hinge side of the door.
- .m Interior non-exit type electrified door hardware shall be mortise type.
- .n The security system shall not control any ADA Power Assisted doors. If there is a card reader associated with an ADA power assisted door, the card reader shall only activate the electric panic device on the door and the ADA button. All wiring of the power assist mechanisms shall be done by the door hardware contractor.
- .o In buildings where services are provided to the general public, a delayed egress panic device shall be used on doors to separate the public from the staff areas where the door is in the path of egress to the nearest exit point. This device shall be controlled by a card reader from the non-secure side to the secure side. The panic device shall be 24 VDC and the trim on the secure side shall have the REX switch that shall be used to shunt the alarm when existing from the secure side to the non-secure side.
- .p Mag locks and electric strikes are not acceptable.
- .q Junction boxes and conduit shall be color coded as indicated in the Wake County Conduit and Box Color Chart in Division 26.
- .r Equipment name plates (metal preferred) with raised or depressed images for permanent attachment shall list the following:
 1. Manufacturer, product name, model number, and serial number.
 2. Capacity, operating and power characteristics, and essential data
 3. Labels of tested compliances.
- .s Minimum conduit size shall be ¾" and all conduit runs shall include pull string. Conduits shall use compression fittings only. Screw fittings are not acceptable. Conduit shall be installed parallel to or at right angles to beams, wall, or, ceilings, or floors. Reference Division 26, Electrical.
- .t Elevators shall be prepped for card readers and video cameras. There shall be a demarcation point terminal block in the elevator equipment room. All wiring from the elevator control cables shall be terminated on one side and all associated control wiring from the security equipment shall be terminated on the other side.
- .u Storefronts, frames, and jambs must be prepared for security devices to be installed.
- .v Wireless devices are not allowed.

- .w Each door control must be tied to the processor that the door is tied to.
- .x Fire alarm system shall override security system.
- .y Coordinate security requirements and integration with Parking Control Equipment and Pedestrian Control Equipment in Division 11.

.3 Codes & Standards

- .a Comply with applicable provisions of the most recent “North Carolina Building Code: Electrical Code”.
- .b Comply with NFPA 72 Codes and Standards.
- .c Comply with all North Carolina Department of Insurance “Requirements for Fire Detection and Alarm Systems”.
- .d Comply with OSHA electrical standards and workmanship.
- .e Comply with NECA 1 “Standard for Good Workmanship in Electrical Construction”.
- .f Comply with the National Electrical Code (NEC).

2 Products

.1 Equipment Selection

- .a The selection and implementation of Fire Alarm, Security, Parking Control and Pedestrian Control Systems shall be approved by Wake County at the schematic design phase.
- .b **Fire Alarm Control Panel**
 1. Field-programmable, micro-based, modular, power-limited design with electronic modules. Include system software and programs to be held in flash electrically erasable programmable read-only memory (EEPROM) retaining the information through failure of primary and secondary power supplies, and a real-time clock for time annotation of events.
 2. Addressable initiation devices shall communicate identity and status. Smoke sensors shall communicate sensitivity settings and temperature sensors shall test for and communicate sensitivity range of the device.
 3. Units shall have Alphanumeric display and systems controls arranged for interface between human operator and addressable system components.
 4. A software service agreement for technical support shall be provided for two years from substantial completion.
 5. For the ease of future system expansion or modification, panel shall be modular plug and play type with independent, encapsulated units that can be inserted into any slot on the panel.
 6. Proprietary systems are not acceptable.
 7. **Fire alarm system must directly control life safety devices.**
- .c **Security Systems:**
 1. Provide alarm control panels, key pads, intrusion detection devices, card readers, electrified locking hardware, duress buttons, release buttons, security intercoms/emergency phones, digital surveillance equipment and digital video recorders on interior and exterior of the facility, video over CAT 6 RJ45 or better cable as approved by owner.
 2. Wireless devices and CCTV shall not be utilized.

3 Testing

.1 Fire Alarm System Testing

- .a Conduct visual inspection prior to testing. Comply with “Visual Inspection Frequencies” Table in the “Inspection” section of the “Inspection, Testing, and Maintenance” Chapter in NFPA 72.
- .b Test audible appliances for the public operating mode and private operating mode.
- .c Test visible appliances for the public operating mode.
- .d Perform reacceptance testing the proper operation of added or replaced devices or appliances.
- .e One year after date of Substantial Completion, test fire alarm system, complying with visual and testing inspection requirements of NFPA 72.
- .f Engage a factory-authorized service representative to train Owner’s maintenance personnel to adjust, operate, and maintain fire alarm system.
- .g Test operation and integration of smoke control system with fire alarm system.

.2 Security System Testing

- .a Each and every device will be tested for proper response and annunciation.
- .b In the event of malfunctions or excessive false alarms the contractor must make take prompt corrective action and may be required to repeat a 100% systems test or other inspections.
- .c After successful completion of inspections and final test by owner, the warranty period begins.
- .d Coordinate field testing at and with Wake County Security Center.