

# 1 General

## **.1 System Requirements**

- .a** A **wet sprinkler system** shall be installed throughout building spaces except for areas that could experience freezing conditions.
- .b** A **dry sprinkler system** shall be installed where freezing conditions could occur by use of either freeze proof heads or a completely separate sprinkler system. Provide two (2) dry contacts, one contact to signal security system. Anti-freeze systems shall not be utilized.
- .c** **Standalone clean agent gas systems** shall be installed library book drop rooms where wet fire protection system is not installed. System shall connect fire alarm system.
- .d** **Pre-action systems** shall be utilized in data centers or other critical areas identified by the County. Use institutional heads only and provide two (2) dry contacts to signal security system. System shall be double action.
- .e** **Clean agent** fire suppression systems may be utilized in critical areas and with Wake County prior approval only.
- .f** Where future expansion is planned in the initial design of a facility the Engineer shall provide adequate additional capacity and connection points in the fire protection design. The additional capacity shall be clearly noted in the schedules.
- .g** All points for future connections shall be clearly shown and labeled on the drawings with the capacity (GPM, etc.) that is available at each connection point.
- .h** Backflow preventer for fire loop shall be located inside a secure room in the building being served. Insulated above ground vaults should be used only where required by the local authority having jurisdiction.
- .i** Fire Hydrants and valves shall be approved by the local inspectors.
- .j** Flexible sprinkler heads are not acceptable. Coordinate head selection with Wake County.
- .k** Dry chemical suppression system to be provided as approved and permitted by the owner.
- .l** Install piping to permit valve servicing. Valves shall be installed vertically or horizontally and not inverted.
- .m** Do not locate pumps, motors, or other equipment requiring routine maintenance overhead.
- .n** Installation of tamper proof or institutional sprinkler heads may be required depending on occupancy type.

## **.2 Codes & Standards**

- .a** Comply with applicable provisions of the most recent “North Carolina Building Code: Fire Prevention Code”.
- .b** Installation shall be in compliance with NFPA 13 and NFPA 14 and tested in accordance with NFPA 25.
- .c** All products specified and installed shall bear the label of UL or other North Carolina recognized third party testing agency.
- .d** Design and installation shall be compliant with the requirements of the “local authority having jurisdiction” (AHJ).
- .e** A hydrant water flow test will be obtained by the Engineer less than one year prior to permit date.
- .f** Fire pumps shall be in accordance with NFPA 20 and Local AHU.

## 2 Products

### .1 Systems and Equipment

- .a The selection of all fire protection systems shall be approved by Wake County at the schematic design phase.
- .b **Sprinkler Systems**
  1. Concealed heads where the ceilings are 10'-0" or less above finished floor shall be installed. Semi-recessed heads shall be installed at all other locations.
  2. The usage of flexible type head connections shall not be permitted.
  3. Wall mounted storage box shall be provided with attic stock of each type of sprinkler head installed. Quantities provided will be determined by the owner.
  4. The Fire Department Connection shall be in compliance with the local Fire Department.
  5. A backflow preventer shall be installed on the system in accordance with the local authority having jurisdiction.
- .c **Fire Pump**
  1. Where required, fire pumps shall be either electric or diesel depending on site conditions and generator capacity.
  2. The fire pump will be equipped with a suction control valve.
- .d **Fire Protection Piping**
  1. Underground piping and fittings shall be ductile iron pipe, ANSI/AWWA C151 and C110 with push-on rubber gasket joints, ANSI/AWWA C111.
  2. Above ground piping and fitting shall be ASTM, schedule 40 black steel for pipe sizes 3" and less, ASTM A135 schedule 10 (or as required by pressure ratings) black steel for pipe sizes 4" and larger.
  3. Above ground piping for pipe sizes 2" and less shall be threaded and 2-1/2" and larger shall be grooved.
  4. All piping to be run parallel and at right angles to walls, ceilings, floors and building structure.
  5. Use US made Schedule 10 steel castings and fittings only.
  6. Galvanized piping shall be permitted **only** on dry systems.
  7. The usage of saddle type, o-ring systems, and gloveless clamp connections shall not be permitted.
  8. Valves and pipe accessories shall be in compliance with NFPA 13 and 14.
- .e **Standpipe System**
  1. Hose valves shall be angle type, brass finish, 2-1/2" size; threads to match the requirements of the local Fire Department hardware, 300 psi working pressure, with threaded cap and chain of same material and finish.
  2. Valve cabinets shall be 20-gauge stainless steel boxes, with 30-gauge tubular steel doors and 18-gauge frame with continuous steel hinges. The cabinets shall be semi-recessed type with full glass door.
  3. Fire department valves without valve cabinet shall be installed in stairwells.
  4. A backflow preventer shall be installed in the system water supply in accordance with the local authority having jurisdiction.

## 3 Execution

### .1 Design Requirements

- .a All water piping shall be located a minimum of 10 ft. from electrical switchboards and panel boards.
- .b The electrical contractor shall provide all power wiring to each piece of fire protection equipment. Fire protection contractor is to make final connection to each piece of fire protection equipment.
- .c Provide protection for all exposed sprinkler heads in areas that may be hit by flying objects. Protective devices must meet all applicable NFPA requirements.
- .d All Warranties shall commence from the date of substantial completion, not from the startup equipment date.
- .e Pipe Labels and Identification shall be provided as noted in the Pipe Label & Identification Chart in Division 23, Exhibit B.
- .f All exposed piping shall be painted in accordance with the Pipe Label and Identification Chart in Division 23, Exhibit B.
- .g Engraved laminated labels shall be provided on **all** equipment
- .h Equipment name plates (metal preferred) 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.
- .i Install valve tags on all valves and provide schedule.
- .j Do not locate pumps, motors, or other equipment requiring routine maintenance overhead.
- .k **Sprinkler design layout and location of sprinkler heads shall be provided with the construction documents. Sprinkler head layout shall be coordinated with ceiling grid, light fixtures, and HVAC distribution and any other ceiling or overhead devices.**

### .2 Testing

- .a A copy of the fire protection performance testing shall be submitted to the designer and Wake County.
- .b A copy of all certification tests shall be available for Fire Marshall at final inspection for issuing Certificate of Occupancy.
- .c Provide fire hydrant flow test.
- .d Provide flow test prior to design and after construction in all cases where fire pumps are to be installed.
- .e Demonstrate and document all NFPA required tests. Documents to be provided in the O&M Manuals.