

# PLAN REVIEWS

The Fire Marshal conducts plan reviews on all new, and remodeled commercial construction, planned multi-residential housing, flag lot development, and residential fire suppression installation. Documents reviewed include:

- Construction Documents plan review
- Fire Suppression Drawings plan review
- Fire Alarm Drawings plan review.

To assist the designer with submittals for review the following information is required on all drawings upon submittal:

## Construction Drawings shall include the following information at a minimum:

- Plans must bear seal of currently Utah licensed Architect and/or Engineer.
- Proposed address for project.
- Indication of architectural scale used.
- Presence of any specialized fire equipment, (fire sprinkler, fire alarm, cooking / ventilation hood systems, smoke removal systems, alternate extinguishing equipment).
- Legend indicating a code summary, found at beginning of document (A-sheets). Items to include:
  - Calculated Occupant Load
  - Occupancy Classification
  - Construction Type
  - Square Footage
  - Wall type
  - Egress Plan
  - Codes and standards used for creation, with edition depicted.
- Site plan to include:
  - Fire apparatus access roads
  - Fire hydrants
  - Engineered water supply analysis with available fire flow (gpm/hr.).
  - Turn abouts (if applicable)
  - North compass point / direction
  - Relative elevations, slope, grade, etc.
- Roof Hatches / Roof Access ladders / stairs, to include dimensions.
- Interior layout of all levels and floors, and components, (doors, walls, ceilings, etc.).

- Location of portable fire extinguisher cabinets.
- Emergency lighting locations
- Description and location of all utilities. Utilities adjacent to roadways, parking lots, shall be protected from vehicular impact.
- Presence of high piled storage / racking.
- Commodity storage description, and amounts.
- Air handling units, locations, and CFM rating.

Fire Alarm Shop Drawings shall include the following information at a minimum:

- Edition of NFPA-72 used for design.
- Name of protected premises, owner, and occupant (where applicable).
- Name of Installer or Contractor.
- Install license number (obtained from the Utah State Fire Marshal's Office).
- Licensed Engineer, NCET Level, State of Utah.
- Location of protected premises.
- Device legend, to include symbols, in accordance with NFPA 170.
- Date of any revision dates.

Floor plan drawings shall be drawn to an indicated scale and shall include the following:

- Floor or level identification
- "North" indication, (point of compass).
- Graphic scale
- All walls and doors
- All partitions extending to within 15 percent of the ceiling height, (except where known)
- Room and area descriptions.
- System devices and component locations.
- Locations of Fire Alarm primary power and disconnecting means.
- Locations of monitor and / or control interfaces to other systems.
- System riser locations.
- Type and number of system components/devices on each circuit, on each floor level.
- Type and quantity of conductors and conduit (if used – preferred) for each circuit.
- Identification of any ceiling over 10ft. in height where automatic fire detection is proposed.
- Details of ceiling geometries, including beams and solid joists, where automatic fire detection is proposed.

- Where known, any acoustic properties of spaces, (to include suspended “clouds”).

System riser diagrams shall be coordinated with the floor plans and shall include the following information:

- General arrangement of the system in building cross section (s).
- Number of risers.
- Type and number of circuits in each riser.
- Type and number of system components, and/or devices on each circuit, and on each floor level.
- Number of conductors for each circuit.

Control unit diagrams shall be provided for all control equipment, (i.e., equipment listed as either a control unit, or control unit accessory), power supplies, battery chargers, and annunciators and shall include the following information:

- Identification of the control equipment depicted.
- Location (s) of control equipment.
- All field wiring terminals and terminal identifications.
- All circuits connected to field wiring terminals and circuit identifications.
- All indicators and manual controls.
- Field connections to supervising station signaling equipment, releasing equipment, or emergency safety control interfaces, where provided.

Typical wiring diagrams shall be provided for all initiating devices, notification appliances, remote indicators, annunciators, remote test stations, and end-of-line, and power supervisory devices.

A narrative description or input / output matrix of operation shall be provided to describe the sequence of operation.

System calculations shall be included as follows:

- Battery calculations.
- Notification Appliance circuit voltage drop calculations.
- Other required calculations, such as line resistance calculations for notification appliance circuits.

Source NFPA-72, 7.4.5. 2018 edition.

### Fire Sprinkler Drawings shall include at a minimum:

- Stamp of Utah licensed Engineer, Designer.
- State of Utah certification number, (obtained from the State Fire Marshal's Office).
- Type of NFPA-13 standard used, (13, 13R, 13D).
- Engineered water supply analysis for site, (gpm/hr.).
- Indication of scale used for creation and review.
- Each floor and location of sprinkler installation.
- Name, owner, and occupant information.
- Location, including street address.
- Point of compass, (north).
- Full height cross section or schematic diagram, including structural member information if required for clarity and including ceiling construction and method of protection for nonmetallic piping.
- Ceiling/roof heights and slopes not shown in the full height cross section.
- Location of partitions.
- Location of fire walls.
- Occupancy class of each area or room.
- Location and size of concealed spaces, closets, attics, and bathrooms.
- Any small enclosures in which no sprinklers are to be installed.
- Size of city main in street and whether dead end or circulating; if dead end, direction, and distance to nearest circulating main; and city main test results and system elevation relative to test hydrant.
- Other sources of water supply, with pressure or elevation.
- Make, type, model, and nominal K-factor of sprinklers, including sprinkler identification number.
- Temperature rating and location of high-temperature sprinklers.
- Total area protected by each system on each floor.
- Number of sprinklers on each riser per floor.
- Total number of sprinklers on each dry pipe system, preaction system, combined dry pipe-preaction system, or deluge system.
- Approximate capacity in gallons of each dry pipe system.
- Pipe type and schedule of wall thickness.
- Nominal pipe size and cutting lengths of pipe (or center-to-center dimensions). Where typical branch lines prevail, it shall be necessary to size only one typical line.
- Location and size of riser nipples.

- Type of fittings and joints and location of all welds and bends. The contractor shall specify on drawing any sections to be shop welded and the type of fittings or formations to be used.
- Type and locations of hangers, sleeves, braces, and methods of securing sprinklers when applicable.
- All control valves, check valves, drainpipes, and test connections.
- Make, type, model, and size of backflow prevention assembly, and means to forward flow test at system demand.
- Make, type, model, and size of alarm or dry pipe valve.
- Make, type, model, and size of preaction or deluge valve.
- Kind and location of alarm bells.
- Size and location of standpipe risers, hose outlets, hand hose, monitor nozzles, and related equipment.
- Private fire service main sizes, lengths, locations, weights, materials, point of connection to city main; the sizes, types and locations of valves, valve indicators, regulators, meters, and valve pits; and the depth that the top of the pipe is laid below grade.
- Piping provisions for flushing.
- Where the equipment is to be installed as an addition to an existing system, enough of the existing system indicated on the plans to make all conditions clear.
- For hydraulically designed systems, the information on the hydraulic data nameplate.
- A graphic representation of the scale used on all plans.
- Name, address, and phone number(s) of contractor.
- Hydraulic reference points shown on the plan that correspond with comparable reference points on the hydraulic calculation sheets.
- The minimum rate of water application (density or flow or discharge pressure), the design area of water application, in-rack sprinkler demand, and the water required for hose streams both inside and outside.
- The total quantity of water and the pressure required noted at a common reference point for each system.
- Relative elevations of sprinklers, junction points, and supply or reference points.
- If room design method is used, all unprotected wall openings throughout the floor protected.
- Calculation of loads for sizing and details of sway bracing.
- Zones of influence used in calculations for seismic bracing indicated on plans.
- The setting for pressure-reducing valves.
- Information about listed antifreeze solution used (type and amount).
- Size and location of hydrants showing size and number of outlets and if outlets are to be equipped with independent gate valves. Whether hose houses and equipment are to be provided, and by whom, shall be indicated. Static and residual hydrants that were used in flow tests shall be shown.

- Size, location, and piping arrangement of fire department connections.
- Edition year of NFPA 13 to which the sprinkler system is designed.
- Hydraulic Calculation formulas, and forms.
- Summary Sheet to include:
  - Description of hazard
  - Design area of water application.
  - Minimum rate of water application
  - Area per sprinkler
  - Head type, size, rating, temperature bulb.
  - Total water requirements as calculated, including allowance for inside hose, outside hydrants, and water curtain and exposure sprinklers.
  - Allowance for in-rack sprinklers, (gpm.).
  - Limitation on extended coverage or other listed special sprinklers.

The working plan submittal shall include the manufacturer's installation instructions for any specially listed equipment, including descriptions, applications, and limitations for any sprinklers, devices, piping, or fittings.

Water supply information required is as follows:

- Location and elevation of static and residual test gauge with relation to the riser reference point.
- Flow location.
- Static pressure, psi (bar).
- Residual pressure, psi (bar).
- Flow, gpm (L/min).
- Date
- Time
- Test conducted by or information supplied by.
- Other sources of water supply, with pressure or elevation.

Source: NFPA 13-27.1. 2019 edition.