PART 1 GENERAL

1.01 RELATED SECTIONS

A. Cornell University Design and Construction Standards
   1. 15435 – Backflow Prevention
   2. 15542 – Chemical Water Treatment
   3. 16721 – Fire Alarm and Detection Systems

1.02 SUMMARY COMMENTS

A. All new construction of academic and residence hall facilities shall be fully furnished with sprinklers.

B. For facilities that are currently unfurnished with sprinklers and are undergoing renovations, consideration must be given to providing sprinklers within impacted areas. Discussions with Cornell University and the authority having jurisdiction (AHJ) shall dictate code compliance and scope of work.

1.03 CODES AND STANDARDS

A. Design shall comply with the requirements of the following codes and standards:


   2. Factory Mutual Global (FM) where applicable.

   3. All applicable NFPA.


B. In the event of an overlap or conflict between the requirements of the codes, laws and ordinances, and this standard, then negotiations involving the AHJ and Environmental Health & Safety (EH&S) shall bring resolution to the dispute.

1.04 DEFINITIONS

A. Authority Having Jurisdiction (AHJ): shall be defined at the inception of the project and has the potential to vary in conjunction with project location. Consult with Cornell University to obtain appropriate AHJ.
B. EH&S – Cornell University Environmental Health and Safety Fire Protection Section. EH&S provides acceptance and inspection of all fire protection and suppression systems.

C. Contractor – When referenced within Section 15300, “contractor” shall mean the firm responsible for preparation of shop drawings and installation of fire protection systems.

D. Project Engineer – The Engineer of record who represents the Design/Engineering firm. The Engineer shall seal with a Professional Engineer (P.E.) stamp all record contract drawings prior to distribution.

E. Owner – Cornell University and/or appointed representative shall be considered the Project Manager or Construction Manager as assigned.

F. FM – Factory Mutual

G. UL – Underwriters Laboratories

1.05 GENERAL DESIGN REQUIREMENTS

A. General Design Requirements:

1. All fire protection systems shall be hydraulically calculated and designed by a qualified designer or fire protection engineer.

2. All fire protection systems shall be monitored by the fire alarm system and Cornell University Central Station (Barton Hall). All buildings equipped with fire sprinkler systems shall also have an exterior local alarm (bell) initiated by the flow detection device (water motor gongs shall not be used).

3. All drains shall discharge to sanitary. Verify capability of existing drains to accept full flow discharge.

B. System Sub-Section Zones:

1. Sub-section zoning shall be provided for the following areas:

   a. Elevator Machine Rooms and Shafts – Flow switches may be specified as deemed appropriate by the engineer. All installations are to be in accordance with ANSI A-17.1.

   b. Transformer Rooms – (double interlock preaction).

   c. Information Technology Rooms – shall not contain wet piping. Wet sidewall heads are acceptable, although preaction is preferred if feasible.
d. Buildings that exceed three floor levels shall be zoned per floor. This will allow phased occupancy in the event of a sprinkler system activation.

e. All other zoning is the discretion of the Engineer.

f. Zone Check flow switch assemblies are preferred over manual inspectors test and drains, if feasible. This device allows the annual inspections to be performed without the discharge of system water.

C. Existing Equipment:

1. The use of existing features should be considered.

2. All equipment or piping shall be inspected and tested for operational integrity and must be in compliance with current code prior to direction being given.

D. System Design Consideration:

1. Wet pipe systems are preferred and shall be used in the majority of applications.

2. Glycol systems shall not be designed or installed unless prior approval has been given by Cornell University.

3. Dry pipe systems are discouraged and shall only be used for incidental areas susceptible to freezing conditions, or to meet specific requirements of special use facilities.

4. If piping is intended to be exposed, the use of screwed fittings is the preferred standard installation.

PART 2 PRODUCTS

2.01 PREFERRED PRODUCTS

A. Portable Fire Extinguishers:

1. Amerex Co.
2. Badger
3. General Fire Extinguisher Corp.

B. Resilient Seat Gate Valves:

1. Kennedy Valve
2. Nibco Inc.
3. Mueller
C. Butterfly and Ball Valves:
   1. Victaulic
   2. Central
   3. Kennedy Valve
   4. Nibco Inc.
   5. Milwaukee
   6. Watts

D. Grooved Mechanical Couplings:
   1. Victaulic
   2. Grinnell
   3. Central

E. Sprinkler Heads:
   1. Central Sprinkler Corp.
   2. Viking Corp.
   3. Globe
   4. Reliable
   5. GEM-Grinnell

F. Fire Protection Specialties:
   1. Croker
   2. Potter Roemer, Inc.

G. Fire System Backflow Preventors (RPZ):
   1. Conbraco Series 40-200
   2. Watts Model 909

H. Check Valves:
   1. Central Sprinkler Corp.
   2. Mueller
   3. Kennedy Valve
   4. Viking Corp.
   5. Victaulic
   7. Reliable

I. Specialty Valves (Dry and Preaction):
   1. Viking Corp.
   2. Central Sprinkler Corp.
J. Alarm Flow and Tamper:
   1. Potter Electric Signal
   2. System Sensor

K. Fire Department Connection (FDC):
   1. Croker
   2. Potter Roemer, Inc.
   3. Elkhart

L. Hydrants:
   1. Kennedy K-81
   2. American Darling B62B

2.02 PIPING

A. All equipment shall be UL listed for fire protection service.

B. All “wet” system piping shall be schedule 40 steel piping with cast or malleable-iron threaded or steel grooved end fittings.

C. All “dry” system piping shall be schedule 40 galvanized piping with galvanized fittings.

D. Copper tubing is acceptable and shall be used if the engineer identifies reasonable advantages.

E. Chlorinated Poly Vinyl Chloride is acceptable for areas of light hazard and residential classification in accordance with all applicable codes. Use of this product requires prior written authorization from the AHJ and Cornell University.

F. Threaded fittings are preferred for exposed systems in aesthetically sensitive areas. The use of plain end fittings is discouraged.

2.03 VALVES

A. Resilient seat OS&Y valves shall be used on the suction of fire pumps and as required for the installation of reduced pressure zone backflow preventors.

B. All other valves shall be ball or butterfly with electronic position indicating tamper switches.

C. All valves shall be suitable for a minimum of 175 psi working pressure. In the event of the pressure exceeding 175 psi due to fire pump operation, 250 psi components shall be specified.
D. All fire service mains shall be controlled by a PIV (post indicator valve) at the building service entrance. All PIVs shall be lockable and monitored by the fire alarm control panel. When selecting the proper location and finish, care should be taken to maintain the aesthetic integrity of surrounding areas.

2.04 BACK FLOW PREVENTORS

A. Refer to Section 15435 – Backflow Prevention.

B. RPZ backflow preventors are preferred on all building fire service mains.

C. On fire pump yard systems, the RPZ is required only at the point of connection to domestic water supply piping. The RPZ shall be installed at the discharge of the fire pump. Install gauges on both sides of the RPZ.

2.05 FIRE DEPARTMENT HOSE VALVES AND CABINETS

A. All hose valves shall be 2 ½” NST and positioned to readily accept a “storz” coupling.

B. Unless specifically required by code or standard, the engineer shall not specify or require fire hoses.

2.06 FIRE DEPARTMENT CONNECTION

A. The AHJ shall dictate the type and style of FDC connection. Location shall be easily accessible and a minimum of 18” above grade. Consideration should be given to snow removal procedures.

2.07 CONTROL

A. Ceiling type sprinkler control installations are not preferred. If this type of installation is provided, adequate access panels (for service and maintenance) must be provided, sized at a minimum of 3’ x 3’, with labels identifier.

2.08 HYDRANTS

A. Hydrants shall not be installed on high pressure pumped fire loops.

B. Specify standard butt height above finished grade as 24” minimum.

C. Butts and steamer connections to face roadway or easiest means of access.

D. Hydrants are to have 5” or 5 1/4” valves.
E. Hydrants shall be Kennedy K-81 or American-Darling B-62-B with two 2 1/2" hoses and one 4 1/2” pumper connection.

F. Hydrants shall be painted with the finish coat in the following colors:
   1. Cornell low pressure system: yarnell brown with a white bonnet.
   2. Cornell high pressure system: fire hydrant red with a white bonnet.
   3. City of Ithaca system: orange.

2.09 EMERGENCY ACCESS LOCK BOXES


PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. All testing shall be in accordance with specified procedures in the listed codes and standards.

B. A representative of Environmental Health and Safety shall witness back flushing of all new installations and hydrostatic testing of new sprinkler installations. The authority having jurisdiction (AHJ) requires that a representative witness the sprinkler and standpipe hydrostatic testing of new installations that are within their jurisdiction. Advance notice and scheduling is required.

C. All fire protection systems shall be thoroughly cleaned and flushed with tri-sodium phosphate prior to final acceptance.

D. Upon completion of final cleaning, systems shall be treated according to Cornell’s Microbiological Influenced Corrosion Control Program.

END OF SECTION