



## 13730

### **Security Access**

*This document provides design standards only, and is not intended for use, in whole or in part, as a specification. Do not copy this information verbatim in specifications or in notes on drawings. Refer questions and comments regarding the content and use of this document to the Yale University Project Manager.*

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### **A. Summary**

This section contains general security-related design requirements.

### **B. System Design and Performance Requirements**

Before developing the project design documents, the Project Manager and Yale University's Security Department should review and/or determine the security requirements. Provide adequate time to conduct a thorough review of the plans. A minimum of 10 working days is needed to adequately review and comment on the plans.

#### **1. Residential Area Entrance Doors**

- a. Residential area entrance doors must be windowless, of solid wood construction, 1-3/4" thick, or constructed of 18-gauge hollow metal mounted to a metal frame.
- b. Equip residential area entrance doors with a fire-rated viewer that provides a 180-degree field of view. In fire-rated door assemblies, the viewer must be "ratable."



- c. Equip residential area entrance doors with ADA-approved, lever-type locking hardware that combines a single action dead bolt and latch bolt lock function. The Best 37H mortise lock is highly recommended for residential areas. This and other locks ordered for residential areas must not contain faceplate buttons. Use the University's new Best restricted key system to key the locks on all residential doors.
- d. Equip residential area entrance doors with lock guards to prevent an intruder from gaining access to the lock latches from the outside.
- e. Where feasible, mount the hinges on the interior side of the door. In those instances where egress requirements dictate that hinges be mounted on the outside of the door, install non-removable pins.

## 2. Roof Area Access

- a. Examine and design access doors and routes to roof areas to prohibit persons from gaining unauthorized access to these areas. Ensure that doors automatically lock when closed, thereby prohibiting re-entry.
- b. Install a 1" throw, deadbolt-type lock. Otherwise, door and hinge requirements are the same as those for residential area entrance doors.

## 3. Doors to Interconnecting Rooms that are not Emergency Exits

To provide occupants with the capability to lock their side of the door, install security surface bolts on interconnecting doors that are not identified as emergency exits.

## 4. Office and Administrative Areas

Individual departments have internal procedures that address security procedures and operations. A project's design should enhance these procedures and the capability of the department to properly secure their areas of responsibility. Coordinate closely with department and security representatives before renovating an office or administrative area.



### 5. Fire and Emergency Exits

#### a. Doors Between Student Rooms

- (1) Equip designated emergency exit doors that interconnect student rooms with AC-powered local alarm devices, and mark the doors appropriately. Battery-operated local alarm devices are not permitted. Install local alarm devices that have a local reset capability for silencing or disabling the alarm.
- (2) Reset devices and door hardware must contain Best interchangeable cores. The Physical Plant Lock Shop is responsible for installing and pinning the cores. This work is not contracted to an outside agency.
- (3) Use Yale University's new Best restricted key system to key the locks on all doors not considered emergency exits.

#### b. Doors Between Common and Residential Areas

- (1) Install locking devices on emergency exit doors that enable egress from such common areas as bathrooms or game rooms to residential areas, but prevent unauthorized, immediate, and silent access to student rooms.
- (2) Equip each common area emergency exit door with a magnetic lock or electric strike that interfaces with the fire alarm system or a pull station and that activates the fire alarm system when opened. Conversely, when the fire alarm system or pull station is activated, the emergency exit door must be released, a local alarm activated, and a silent fire alarm signal enunciated at the alarm monitoring station.
- (3) Place a sign on each door indicating that the door is alarmed and is a designated emergency exit.

### 6. Residential and Office Area Separation

Make every effort to segregate office and residential areas. If it is absolutely necessary to co-locate faculty and administrative offices with residential areas, take access control, operational, and other measures to ensure the safety and security of the residences. As a minimum, equip residential areas with some form of physical or electronic access control to restrict non-resident access to the residential areas.



### 7. Electronic Access Control

- a. Consider perimeter control for all facilities. Residential facilities have the highest priority for implementation of electronic access control.
- b. Electronic access control systems should be capable of indicating whether a monitored door is closed or open, locked or unlocked. Electronic access control systems should also be capable of being programmed to initiate a predetermined alarm at the control center for specific conditions.
- c. Do not install electronic access control components, especially heat- and humidity-sensitive components in such areas as mechanical rooms and tunnels that are not compatible with the components.
- d. Electronic access control equipment, such as control panels, modems, and remote or satellite units, should be installed only in secure areas and within locked and secure cabinets.
- e. The Ezra Stiles, Morse, Silliman, Jonathan Edward, Berkeley, and Calhoun residential colleges are wired for electronic card access. Wiring originates in the general area of the telephone terminal closets and terminates at entryways. Do not disturb the existing conduits and wiring during the renovation of these colleges.
- f. In colleges where wiring has not been completed, make provisions for the installation of wiring, conduit, and other components that will expedite the future installation of electronic security measures. Coordinate the installation with the Yale University Security Department.



### 8. ADA and Other Special Needs Requirements

- a. All ADA components and devices and AD installations must comply with applicable building and fire safety codes.
- b. Install the following security and life safety equipment and devices in rooms designated for occupancy by persons with special needs:
  - A wide-angle peephole positioned 48" above the floor to provide wide-angle viewing for wheelchair-bound persons as far as 18" from the door
  - An emergency alarm that enunciates at the alarm monitoring station
  - A fire alarm module that provides an in-room audible and visual means of signaling a fire alarm
- c. Electronic access control devices and automatic door openers should be installed along the entire route that a person with special needs must travel to access their designated suite or room. Access can be a gate, an entryway, and a suite or room door.

### 9. Lighting

#### a. Exterior Lighting

- (1) Use incandescent, fluorescent or metal halide-type lamps for exterior security lighting in pedestrian areas.
- (2) Use high-pressure sodium lamps for parking area lighting.
- (3) Use a minimum level of 0.5 horizontal foot-candles for walks and other pedestrian passage areas. Depending upon a given lighting application, lower levels (to a minimum of 0.35 foot-candles) are permitted upon approval by the Yale University Security Department.
- (4) A maximum illumination uniformity ratio (average to minimum illumination level) of 6:1 is required for walks and other pedestrian passage areas. A ratio of 3:1 might be required for specific lighting applications.
- (5) To provide some illumination in the event of a lighting failure or vandalism, consider overlapping illumination coverage.



- (6) Illumination patterns (symmetrical, asymmetrical) are determined by the lighting application.
- (7) Where automatic control is required for security and/or safety lighting, use photoelectric sensing devices or other University-approved automatic means to control the lighting. The use of time clock-type switching is not permitted.

### *b. Interior Lighting*

Interior lighting must provide for a safe and secure environment.

### *c. Special Lighting*

Special lighting reviews might be required for areas where closed circuit television coverage is required or for loading docks, isolated entryways, and other areas.

## **10. Elevators**

- a. Elevators that provide access to residential areas must have electronic or mechanical key controls that restrict non-residents from access to the residential floors and areas. Do not publish key codes in project documents, such as specifications.
- b. Equip elevators with an emergency telephone that connects directly to the Police Communications Center at Phelps Gate or the alarm monitoring station at 100 Church Street South. Information concerning the approved types and models may be obtained from the Yale University Telecommunications Department.
- c. Emergency telephones installed in elevators and areas of refuge telephones must be “hands free” type and ADA compliant. ADA compliance includes visual signaling indicators for the hearing impaired.

## **11. Master’s House**

The homes of Masters who reside in residential colleges are equipped with intrusion alarm systems. When feasible, renovations to these homes should include upgrading the existing alarm system. Coordinate closely with the Yale University Security Department when renovating these homes, guest suites, and other alarmed areas within the residential colleges.



## 12. Window Protection

### a. *Expanded Metal Grates and Bars*

Expanded metal grates and bars may be used to protect window openings for emergency purposes only and not as a standard for future use or for installation in large numbers.

### b. *Security Screens*

(1) The installation of security screens is the primary method of protecting window openings.

(2) Security screen minimum standards:

- The frames must be constructed of aluminum.
- The wire must be 16-gauge, stainless steel alloy (302/304)
- The maximum mesh size is 12 strands per inch.
- Screens must be quick-release, single action, pull-in type units that meet the State of Connecticut Fire Safety Code egress requirements.

### c. *Casement Windows (to be published)*

## 13. Mechanical Keys

a. Best is the standard keying system for Yale University.

b. Coordinate the re-keying or coring of locks on new projects with the appropriate Yale University lock shop. All requests to use outside contractors must be routed through the Yale University Security Department.

c. Use the Best restricted keying system in residential areas and in facilities that require a high level of security and accountability.



### **14. Emergency Phones and Intercoms**

- a. The Yale University Telecommunications Department is responsible for the purchase and installation of phones used throughout the University. They also establish the type, model, and manufacturer requirements. Coordinate with the Telecommunications Department on all communications requirements.
- b. Coordinate emergency phone locations with the Yale University Police Department's Crime Prevention Unit.
- c. Emergency phones and intercoms are linked directly to the Police Communications Center at Phelps Gate or the alarm monitoring station at 100 Church Street South. When activated, these devices solicit a police response. Emergency phones may be installed in:
  - designated areas of refuge,
  - isolated areas inside academic and administrative buildings, and
  - outside locations approved by the Yale University Police Department's Crime Prevention Unit.
- d. The blue emergency phones are weatherproof, are equipped with other special features, and are recommended for exterior use only.
- e. In addition to emergency phones, other devices (such as intercoms) may be used for communicating emergencies. Prior to installing intercom stations, ensure that the design complies with Yale University Security Department requirements.

### **15. Yale Real Estate Properties (to be published)**

### **16. Yale Leased Properties (to be published)**

### **17. Administrative Offices (to be published)**



### **18. Computer Facilities**

Renovations that involve computer centers, clusters, laboratories, and other similar facilities must be reviewed by the Yale University Security Department. Of particular concern is the type of furniture used, room configuration, and other design issues that can affect the installation of alarm systems.

### **19. Construction Site Security**

During the construction phase, the security of the college or building and articles within are of major concern. Contractors who have successfully bid on a project must submit a security plan that encompasses such areas as access control, guards, hours of operation, point of contact, key requirements, and other factors, as described in the Yale University Project Manual. Contractors must submit security plans through the Project Manager to the Yale University Security Department for review and approval before beginning the project.

### **20. Security Fencing (to be published)**

### **21. Special Facilities**

#### *a. Residential Laundry Facilities*

Residential laundry facilities should:

- be well-secured,
- be restricted to access by authorized persons only,
- contain a telephone that may be used for emergency purposes, and
- provide sufficient lighting within the facility and along corridors leading to and from the facility.

#### *b. Locker rooms (to be published)*

#### *c. Residential bathrooms (to be published)*

#### *d. Bicycle storage racks and devices (to be published)*



### C. Submittals

Use the industry-standard CSI MasterFormat™ for all construction documents. If a summary of the project's security-related requirements is required for review, a cross-reference or a separate listing should be requested from the designer.

End of Section



## 13915

### **Fire Suppression**

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### **A. Summary**

This section contains design criteria for building fire suppression systems. See Yale Fire Protection Specification, Section 15310 for system installation specification details.

### **B. Sprinkler and Standpipe System Design and Performance Requirements**

#### **1. General**

If not specifically covered in the building design program or mandated by the building code, the architect will decide during the early design stage what types of fire extinguishers, sprinklers, and standpipe systems to include. Also, the insurers will review an early printing of the contract documents. Therefore, schedule a meeting, through the Yale University Facilities group, with the University Fire Marshal and with the municipal Fire Marshal having jurisdiction to discuss the project and its fire protection requirements.



### 2. Design Considerations

- a. Fire Protection designs must account for end-user needs and the actual conditions encountered in the field during construction. Coordinate equipment locations with existing and new architectural, structural, and mechanical work.
- b. Construction drawings must reflect, as closely as possible, actual equipment locations and piping routes.
  - (1) Where possible, surface mount fire suppression system equipment (for example, panelboards, starters, contactors, and control panels) in dedicated electrical rooms so that exposed conduits can be run to the equipment, facilitating future changes. Where dedicated electrical rooms are not available, locate such equipment in mechanical rooms or electrical closets.
  - (2) Install a fire alarm annunciator panel at the designated Fire Department building access area.
  - (3) Follow NFPA and BOCA requirements for earthquake protection and seismic bracing.
  - (4) Where possible, all fire sprinkler piping must be concealed or directed.

### 3. Combined Systems

The standpipe system and the sprinkler risers can be combined when the system is hydraulically calculated.

### 4. Hydraulic Design Versus Pipe Schedule

- a. Design all sprinkler systems based on the hydraulic design as stated above and NFPA 13. Design systems to include inside and outside hose streams as listed in NFPA.
- b. Use a pipe schedule only when adding to an existing system that was installed based on a pipe schedule and when adding less than 10 sprinkler heads. If 10 or more sprinkler heads are to be added, then base the entire system for the floor on hydraulic design.
- c. If additional sprinkler heads are to be installed on a hydraulically designed system, the addition must be hydraulically designed.



### 5. Hydraulically Calculated Fire Protection Systems

Sprinkler systems must be hydraulically designed for each hazard group density in a project based on NFPA requirements, the proposed campus wide high-pressure fire main system, Yale Fire Marshal requirements, and municipal requirements.

### 6. Water Supplies

Obtain fire pump and hydrant flow test data from the Yale University Fire Marshal to determine the water supply available and its pressure at the project location. Obtain data on the campus high-pressure fire mains and fire pumps from the Yale University Fire Marshal.

### 7. Piping Mains

The fire main minimum piping size must be:

- 10" underground or 8" above ground. (If a building has a fire main loop and it is connected at both ends, a 6" main may be used.)
- 6" loop within a building
- 8" feeder for a building from the express main
- 10" express mains for more than one building

### 8. Multiple Water Feeds to a Single Area

Fire mains on each floor must have only one control valve per section. If more than one supply is needed on a floor, split the system with a separate supply for each section of the building, No area may have more than one supply (for example, no cross-connection of mains).

### 9. Factors Influencing the Water Demand for Sprinklers

The water demand required for sprinkler protection depends upon occupancy, discharge density, design area, type of sprinkler system (wet or dry), type of construction, and other building features.

### 10. Water Demand for Sprinklers

Use Table 1 to determine the water demand required for sprinklers.



### 11. Design Densities

Design densities in Table 1 are minimum densities. Each sprinkler in the design area must discharge at least the flow rate required to produce the stipulated density.

### 12. Design Area

The design areas shown in Table 1 are the most hydraulically-remote areas.

### 13. Water Demand for Hose Streams

Hose streams are needed concurrently with sprinkler discharge to achieve final extinguishment or to wet down adjacent structures. Use Table 1 to determine the hose stream demand for sprinklered occupancies.

### 14. Total Water Demand for Sprinklered Occupancies

The total water demand for sprinklered occupancies is equal to the sum of the domestic demand plus the sprinkler system(s) water demand and the hose stream(s) demand. The total demand must be available at the sprinkler system connection to the underground main, and at the pressure necessary to produce the required sprinkler density over the required, most hydraulically-remote area of sprinkler operation.

**Table 1. Water Demands for Sprinklered Facilities**

Occupancy Classification	Sprinkler		Hose Gal/Min
	Design Density (Gal/Min)/Sq Ft	Design Area Sq Ft <sup>1</sup>	
Light Hazard	0.10	1500	100
Ordinary Hazard Group 1	0.14	2000	250
Ordinary Hazard Group 2	0.19	2000	250

<sup>1</sup> For dry pipe and preaction systems, increase design area by 30 percent.



### 15. System Types

- a. All systems must be wet pipe, except in areas subject to temperatures below 40°F, which must have a dry pipe system installed.
- b. Install dry pipe systems in all areas subject to temperatures below 40°F, such as attics and unheated areas.
- c. Use a pre-action system only in areas where water damage by accidental activation or damage to a sprinkler head is of most concern.

### 16. Occupancy Classifications

#### a. *Light Hazard*

- Dwelling units
- Chapels
- Classrooms
- Libraries, except stack areas
- Offices
- Data processing or computer rooms
- Theaters and auditoriums, except stages and prosceniums

#### b. *Ordinary Hazard I*

- Dining hall kitchens
- Attics and basements used for storage

#### c. *Ordinary Hazard II*

- All laboratory units
- Library stack areas
- Mechanical rooms
- Custodial rooms
- Stages



### **17. Protection of Domestic Water Supplies**

Install a reduced-pressure back-flow preventer (RPBFP) on all fire sprinkler or standpipe systems, as required by the regional water authority, but not on the Yale University high-pressure fire main since it already has at least one RPBFP. Include any pressure reduction in the system hydraulic calculations. Install the back-flow preventer inside the building, with control valves before and after the unit. Pipe the drain to a proper drain location, such as outside, to a sump pit, or to a floor drain that is in good condition. Verify the condition of all drains before any piping is done. Install the back-flow preventer after the fire pump, per NFPA 20.

### **18. Main Drain Capacity**

Pipe all main drains from the sprinkler system and standpipe system to a proper drain location that can handle both water supply testing and draining of the systems. Proper drains are from alarm check valves, dry pipe valves, pre-action valves, deluge valves, riser valves, and sectional drain connections, including drain lines at floor control valves. These drains must be piped outside the building or to a sump pit that can handle a flow of 250 GPM for at least 3 minutes. Size the main drain per NFPA 13.

### **19. Valves—Above Ground and Within Buildings**

All control valves must be butterfly valves. Each valve must have a built-in tamper switch and two sets of contacts. Connect the tamper switch to the building fire alarm system as a separate point or zone and as a supervisory alarm (trouble), but not on the same point or zone of any alarm-causing device. All valves must be left hand to open (counter-clockwise).

### **20. Valves—Underground**

All curb boxes, post indicator valves (PIVs), and other control valves must be left hand to open (counter-clockwise). All PIVs must include a tamper switch with two sets of contacts.



### 21. Roof Manifolds

Provide roof manifolds, as required, to test the standpipe system for proper flow and pressure at the top of the most remote riser. Provide all manifolds subject to freezing with a butterfly valve that includes:

- a tamper switch,
- an auxiliary drain with valve, and
- a hose connection and cap above the control valve.

### 22. Pipe Identification

- a. Provide color-coded pipe identification markers. Pipe markers must be snap-on laminated plastic with an acrylic coating applied after architectural painting.
- b. Provide an arrow marker with each pipe content marker to indicate direction of flow. If flow can be in either direction, use a double-headed arrow marker.
- c. Label mains as follows:
  - At points of entry and exit from the mechanical room
  - At points of entry and exit from the building
  - Next to valves
  - On risers
  - At tee fittings
  - At least once in each room
  - At intervals not longer than 20 ft
- d. Label piping with SETON pipe marking system as per NFPA13.



**Table 2. Pipe Marker Identification**

Service	Legend	Background Color
Sprinkler	Sprinkler	Red
Combined Sprinkler - Standpipe	Sprinkler - Fire	Red
Fire	Fire	Red

- e. Provide valve tags on fire protection valves and valve charts. Valve tags must list the building and valve number. The chart must be wall-mounted, and its location coordinated with the University Fire Marshal.
- f. Piping over electrical switchgear requires special consideration. Piping should be routed clear of such gear if possible. Contact the electrical designer for approval if it is not possible to reroute the piping. See [Section 00700: General Design Conditions](#) for drip tray below piping requirements.
- g. All standpipes, must be 6" ID, except in the residential colleges where by hydraulic calculation they can be 4" ID.
- h. Siamese connectors must use threads designated by the Yale University Fire Marshal.
- i. Provide fire plugs with threaded connections per Yale Fire Marshal.
- j. Provide NIC portable fire extinguishers. Yale University will specify the size. Portable fire extinguishers are usually mounted in recessed cabinets with doors, and are usually located in egress areas in or near egress stairwells. The Yale University Fire Marshal will determine additional locations. Extinguishers must be mounted with the top a maximum of 60 inches above floor.



### **C. Submittals**

Designer submittals must include the following:

- Preliminary calculations to determine water flow requirements and the need for a fire pump
- Fire pump selection and pump curve
- List of fire protection equipment, including the manufacturers' name and model or catalog number
- Owner's certificate (as outlined in NFPA 13, Chapter 4)

### **D. Product Standards**

Products must conform to the following standards:

1. Color banding must meet the latest ANSI and OSHA requirements.
2. Use only Underwriters Laboratories- or Factory Mutual-listed items.

### **E. Manufacturers**

See Yale Fire Protection Specification, Section 15310.

### **F. Materials**

See Yale Fire Protection Specification, Section 15310.

### **G. Installation Guidelines**

See Yale design standard for Fire Protection Specialties, Section 15310.



### H. Quality Control

Contractor directions must include the following:

1. Arrange for the testing of completed units of work in successive stages in each area. Do not proceed with the next system and area until the test results for the work completed previously is verified to be in compliance with the design requirements.
2. Provide a contractor's material and test certificate for below- and above-ground piping.
3. Provide the services of a factory-authorized service representative to supervise the field assembly of components and the installation of the fire pump, including piping and electrical connections. Report the results in writing.
4. If incorporating commissioning into this portion of the project, verify that:
  - a. Specification insertions to this section have been made that reference commissioning procedures and the commissioning specification section.
  - b. This section does not conflict with commissioning procedures for testing and training.

End of Section