

ADMINISTRATIVE ORDER #2017-3

FIRE PROTECTION SYSTEMS

1) Purpose:

The purpose of this Administrative Order is to provide for consistency in administering and enforcing applicable Codes, Standards and Ordinances related to the installation of automatic fire sprinkler systems, fire department connections (FDC's), private fire and wall hydrants and related equipment.

The purpose of this Administrative Order is to establish the minimum requirements consistent with nationally recognized best practices for providing a reasonable level of life safety and property protection from the hazards of fire, explosion or dangerous conditions in new and existing buildings, structures and premises and to provide safety to fire fighters and emergency responders during emergency operations.

2) Justification:

The information outlined and specified in this document provides the Department of Code Compliance and Manheim Township Fire Rescue (MTFR) the necessary information to ensure compliant, consistent and standardized fire protection installations. This information is important to Manheim Township Fire Rescue in order to preplan for fire and emergency events.

Standardized fire department connections, hydrant types, locations and signage aid the fire department in finding and making quick connections to public or private water supply for prompt extinguishment of fires in structures utilizing automatic fire sprinkler systems and/or standpipes.

3) Technical Specifications:

Each page of this Administrative Order will outline a specific fire protection system component or topic. Capital letter designators "A", "B", "C", etc. represent a specific topic or category of this Administrative Order.

- A. Automatic Fire Sprinkler System Construction Document Submittals
- B. Residential Sprinkler System Requirements
- C. Record Plans for Fire Service Use
- D. Fire Pump Room Layout Requirements
- E. Fire Department Connections
- F. Private Fire Hydrant, Standpipe & Wall Hydrant Connections
- G. Clearance Requirements for Fire Protection System Components
- H. Signage & Alarm Requirements for Fire Protection Equipment
- I. Truss Roof and Truss Floor Assembly Signs
- J. Identification of Gas Piping in Buildings with Fire Sprinklers
- K. Model Door Numbering System
- L. Lock Box / Key Box Requirements

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A. Automatic Fire Sprinkler System Construction Document Submittals

- i. Automatic fire sprinkler systems shall be designed in accordance with the currently adopted Manheim Township Ordinances, International Building Code, International Fire Code and applicable NFPA Standards including but not limited to NFPA 13, NFPA 13R, NFPA 14, NFPA 20, NFPA 24.
- ii. Automatic fire sprinkler plan submittals shall consist of two (2) sets of construction documents, which include scaled plans, specifications, City of Lancaster's Public Works Department hydraulic water capacity & modeling calculations (that have been generated within 12 months of the submittal date that are specific to the project) and manufacturer's specifications sheets for all applicable components of the proposed system. Drawings and hydraulic calculations are to be signed, sealed and dated by a Professional Engineer registered in the Commonwealth of Pennsylvania with experience in automatic fire sprinkler design OR by a Level III or Level IV NICET (National Institute for Certification in Engineering Technologies) Fire Protection Engineering Technician in automatic sprinkler system layout and design.
 - a. No work shall start on any portion of the automatic fire sprinkler system until construction documents are received and approved by the Code Compliance Dept.
 - b. IBC Fire Areas have been reduced to 7500 square feet in certain occupancies. Per Township Ordinance 2004-8 the following fire areas apply:
 - i) **Group A-1:** Fire area reduced to 7,500 square feet
 - ii) **Group A-3:** Fire area reduced to 7,500 square feet
 - iii) **Group A-4:** Fire area reduced to 7,500 square feet
 - iv) **Group E:** Fire area reduced to 7,500 square feet
 - v) **Group F-1:** Fire area reduced to 7,500 square feet
 - vi) **Group F-2:** An automatic fire sprinkler system shall be provided throughout all buildings containing Group F-2 occupancies where a Group F-2 fire area exceeds 7,500 square feet.
 - vii) **Group M:** Fire area reduced to 7,500 square feet
 - viii) **Group S-1:** Fire area reduced to 7,500 square feet
 - ix) **Group S-2:** An automatic fire sprinkler system shall be provided throughout all buildings containing Group S-2 occupancies where a Group S-2 fire area exceeds 7,500 square feet.
 - x) **Group B:** An automatic fire sprinkler system shall be provided for Group B occupancies where one of the following conditions exist:
 - 1. Fire area exceeds 7,500 square feet
 - 2. The building is 3 or more stories.

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B. Residential Sprinkler Systems Requirements

- i. Automatic residential fire sprinkler systems shall be designed in accordance with the currently adopted Manheim Township Ordinances and either the International Residential Code or NFPA 13D.
- ii. **Plan Submittal Requirements:** Automatic fire sprinkler plan submittals shall consist of two (2) sets of construction documents, which include scaled plans, specifications, City of Lancaster's Public Works Department hydraulic water capacity & modeling calculations specific to the project (if applicable – tank and pump systems are permissible) and manufacturer's specifications sheets for all applicable components of the proposed system. Drawings and hydraulic calculations are to be signed, sealed and dated by a Professional Engineer registered in the Commonwealth of Pennsylvania with experience in automatic fire sprinkler design OR by a Level III or Level IV NICET (National Institute for Certification in Engineering Technologies) Fire Protection Engineering Technician in automatic sprinkler system layout and design.
- iii. Design, Installation & Inspection Requirements
 - a. **Alarm Requirements**
 - i) A local, audible water flow alarm shall be provided on the interior of dwellings equipped with residential sprinkler systems. The interior alarm shall be audible in all sleeping rooms.
 - b. **Spare Sprinkler Requirements**
 - i) At least two (2) each of represented sprinkler heads are to be provided and maintained in a cabinet at the sprinkler riser. The required sprinkler wrench shall be provided and kept in the cabinet with the spare heads.
 - c. **Tank and Pump System Requirements**
 - i) Per NFPA 13D, a method for refilling tank(s) associated with 13D sprinkler systems is to be piped to the tank(s). Domestic piping for sprinkler tank fill purposes is to be protected against backflow per IRC Chapter 29.
 - d. **Antifreeze Systems**
 - i) Antifreeze systems are not to be installed as part of residential dwelling unit automatic fire sprinkler systems.

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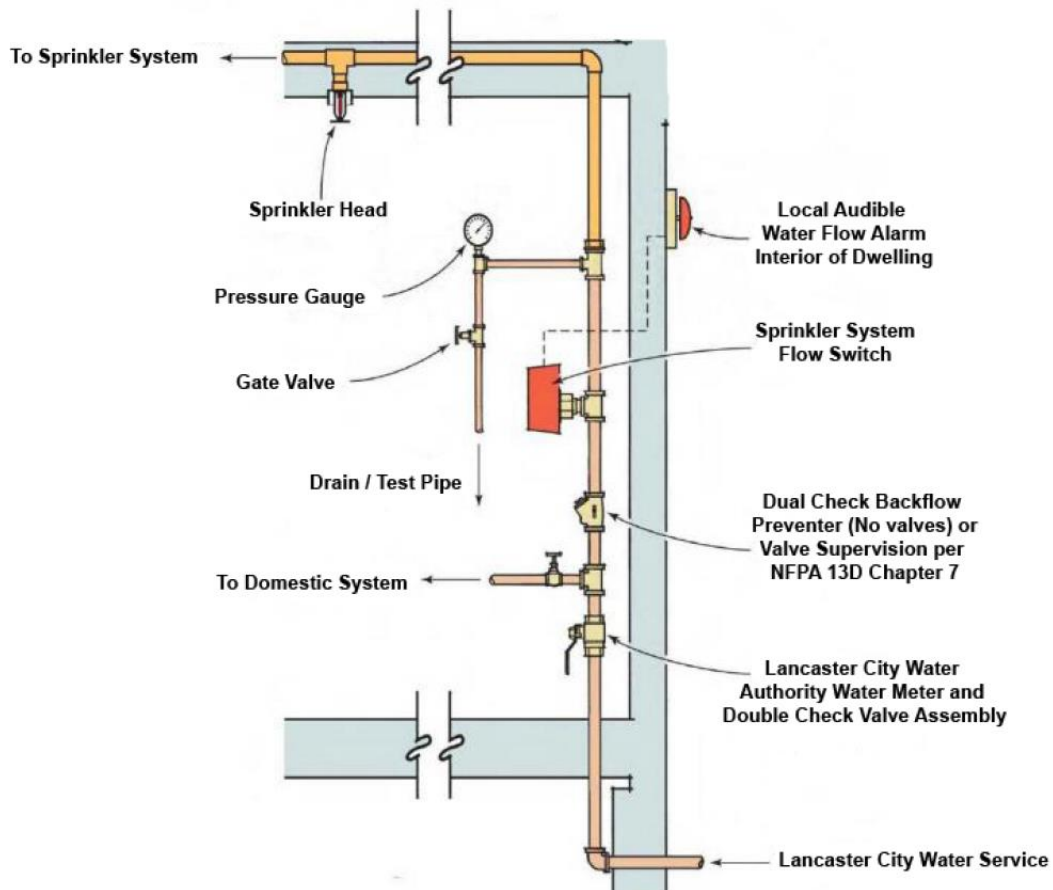
B. Residential Sprinkler Systems Requirements, continued

iii. Design, Installation & Inspection Clarifications, continued

e. Inspection Requirements

- i) Rough Inspection – Inspection to include verification of water supply pipe size and materials, sprinkler riser, sprinkler system piping size and installation, sprinkler head locations and all components of the system that may be concealed.
- ii) Hydrostatic Test - A Hydrostatic test of the complete system is to be completed as part of the rough inspection at 200 PSI and shall maintain the required test pressure, without loss, for 2 hours.
- iii) Final Inspection – Inspection to include functional test of the water flow switch, local water flow alarm, visual inspection of all components of the system including sprinkler heads, control valves, check valves, water supply pressure verification, labeling of components, spare parts box and required signage.

f. Typical Residential Combination Domestic / Fire Sprinkler Riser Diagram



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C. Record Plans for Fire Service Use

- i. Prior to final inspection approval and prior to the issuance of a Certificate of Use and Occupancy, the following plans are to be submitted to the Code Compliance Department. The plans will allow Manheim Township Fire Rescue to efficiently and effectively pre-plan for fire and emergency events.
- ii. Projects requiring fire service plan submittals include:
 - a. IBC regulated new building construction and additions exceeding 1000 square feet in building area.
 - b. Extensive renovations or alterations as determined by the Director of Code Compliance.
- iii. The following plans are to be submitted for retention:
 - a. Architectural floor plans of each level of the building(s) including a roof plan.
 - i) The first floor plan is to include all exterior door letter and number designators as stipulated in our Model Door Numbering System found later in this document.
 - b. Fire protection system plan(s) such as automatic fire sprinkler, automatic fire detection systems and manual pull stations, etc.
 - c. Site plans with utilities such as electric, gas, water, sewer, communications, parking.
- iv. Electronic media format and submittal requirements:
 - a. Plans are to be submitted in Portable Document Format (.PDF) on Compact Discs (CD) to the Manheim Township Department of Code Compliance prior to the issuance of the Certificate of Use and Occupancy. Code Compliance will deliver the CD to the Manheim Township Fire Chief and record the delivery in a logbook maintained at the Manheim Township Municipal Office Building.

D. Fire Pump Room Layout Requirements

- i. **Equipment restrictions in fire pump rooms:** Per NFPA 20, "Equipment that increases the fire hazard (such as boilers) and is not related to fire protection systems should not be in the fire pump room." *Boilers, hot water heaters, electrical equipment, electrical raceways, wiring and related system components such as piping, ducts, etc. not directly related to the fire pump, and other equipment deemed to increase the fire hazard is prohibited from installation in a fire pump room.*
- ii. **Storage and penetrations in fire pump rooms:** Per NFPA 20, "Rooms containing fire pumps shall be free from storage and penetrations not essential to the operation of the pump and related components."

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E. Fire Department Connections

- i. FDC installations shall comply with the following requirements:
 - a. Fire department connections (FDC's) shall be installed within approximately 100 feet of a fire hydrant. Fire hydrants shall conform to City of Lancaster, PA specifications and be supplied by a water main at least 6 inches in diameter and be in direct connection to an approved municipal or private water main. If private hydrants are present, refer to Section F of this Administrative Order.
 - b. Fire Department Connections (2 ½ inch diameter outlet) shall be National Standard Thread (NST).
 - c. Fire Department Connections shall be mounted between 18"-42" above grade.
 - d. FDC permanent identification signage is to be of a type and size as described in Section H of this Administrative Order.
- ii. Where more than two (2) FDC connections are proposed at one location, the following standpipe configuration is required:
 - a. In lieu of 3 or more FDC nozzles, a single 5 inch locking Stortz connection with blind cap and suction seal is to be provided. The 5 inch locking mechanism shall be added to the adaptor. The blind cap shall be connected to the adaptor with vinyl coated aircraft cable or a compatible pumper chain / S-hook.



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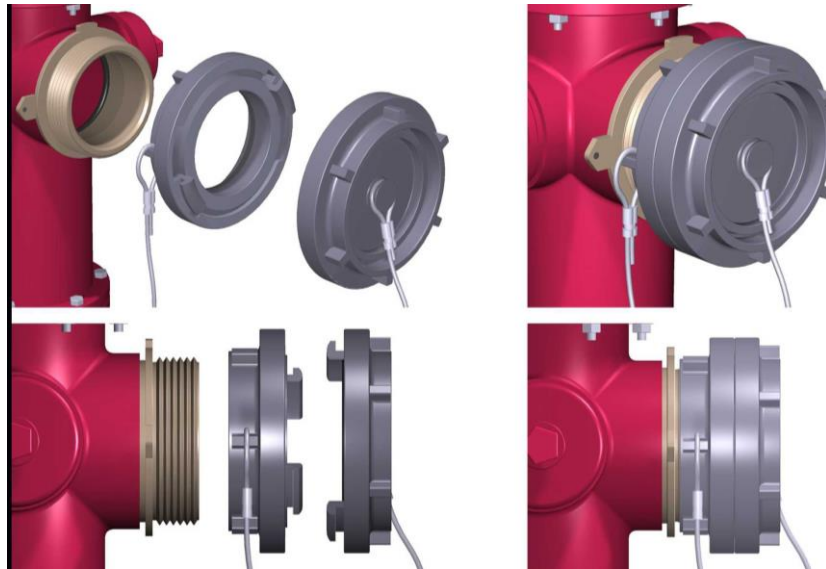
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F. Private Fire Hydrant, Standpipe & Wall Hydrant Connections

- i. New / replacement private yard hydrants, standpipes and wall hydrants shall comply with the following requirements:

a. Private Fire Hydrants

- i) Private fire hydrants are to be configured with a **5" locking connection with a Stortz adaptor connection on the 4 1/2" steamer hose nozzle**. The Stortz adaptor connection is to be installed with Stortz blind cap with suction seal. The blind cap shall be connected to the adaptor with vinyl coated aircraft cable or a compatible pumper cap chain / S-hook. The 5 inch locking mechanism shall be added to the adaptor.



- ii) Private fire hydrant 2 1/2" ears threads shall be National Standard Thread (NST).
- iii) Private fire hydrants shall be painted 7727-730 Royal Blue using RUST-OLEUM oil-based *High Performance Protective Enamel*.
- iv) Private fire hydrants shall be equipped with blue, Maltese Cross shaped, reflective fire hydrant rings installed on the two (2) 2 1/2" ear connections. Rings are to be Blue - 2 1/2" Hose Connection Marker by Mark-A-Hydrant. Rings are to be UV and weather resistant plastic.
- v) Private fire hydrants that are located at the termination of a cul-de-sac or other dead end roadway, where fire service response requires approaching the fire hydrant head-on shall be equipped with a single, blue, Maltese Cross shaped reflective fire hydrant ring on the 4 1/2" pumper connection. The ring is to be blue, 4 1/2" pumper connection marker by Mark-A-Hydrant and is to be UV and weather resistant plastic.

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F. Private Fire Hydrant, Standpipe & Wall Hydrant Connections, continued

b. Wall Hydrants

- i) Wall hydrant (2 ½ inch diameter outlet) threads shall be National Standard Thread (NST).
- ii) Wall hydrant permanent identification signage is to be of a type and size as described in Section H of this Administrative Order.

c. Standpipe Hose Connection Location

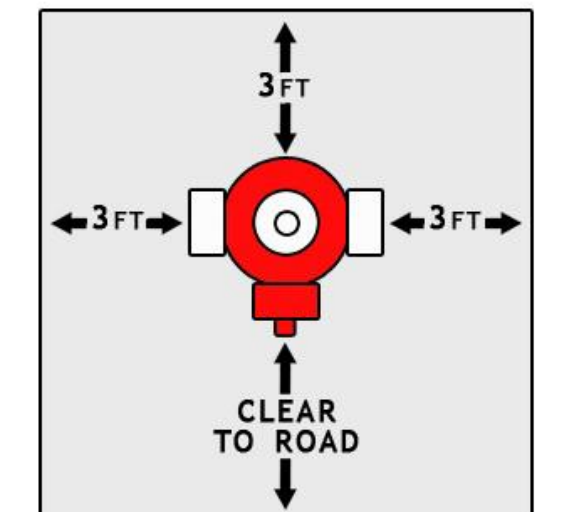
- i) Standpipes that are specified to be located within stairway enclosures shall be located at each floor landing, not at intermediate floor level landings between floors.

Threads and other requirements for public hydrants are regulated by City of Lancaster Water Bureau

G. Clearance Requirements for Fire Protection System Components

- i. The area in front of and around Fire Hydrants (Public and Private), Fire Department Connections (FDC's), Standpipes, and Thru Wall Control Valves shall:
 - a. Be maintained clear at all times.
 - b. Have no plantings which will restrict access or other obstructions placed within a 6 foot wide area (3 foot on either side of the centerline of the fire protection system).
 - c. Clearances apply to new and all existing fire protection system components.

Clearance Requirements for Hydrants, FDC, Standpipes and Control Valves



FRONT & SIDE CLEARANCE TO BE MAINTAINED
AT ALL HYDRANTS, FDC'S, STANDPIPES
AND THRU WALL CONTROL VALVES

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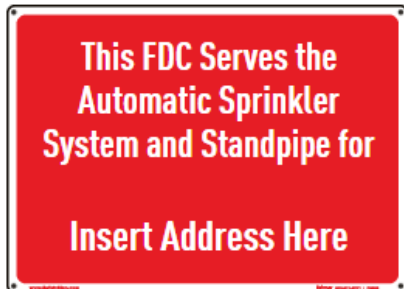
H. Signage & Alarm Requirements for Fire Protection Equipment

i. Sign Construction Specifications

All fire protection equipment signage shall be constructed of approved, durable materials, be colored with a red background with white letters and numbers. Signs shall be permanently installed with corrosion resistant fasteners and be readily visible. The sign lettering and numbering shall be 2 inches in height. If a material other than metal is used for a freestanding sign, a suitable and weatherproof backing shall be installed behind the sign.

ii. Fire Department Connection (FDC) Signage Requirements

- a. FDC's shall have permanent identification signs attached to the structure or FDC standpipe in an approved location determined by the Director of Code Compliance and the Fire Chief.
- b. The approved sign shall read as follows:
“This FDC Serves the Automatic Sprinkler System” and/or “Standpipe System” For (Insert Street Address)”



iii. Wall Hydrant Signage Requirements

- a. Wall hydrants shall have permanent identification signs attached to the structure or hydrant in an approved location determined by the Director or Code Compliance and the Fire Chief.
- b. The approved sign shall read as follows:
“Private Wall Hydrant Serving (Street Address)”



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H. Signage & Alarm Requirements for Fire Protection Equipment, continued

iv. Dry Standpipe Systems Signage Requirements

- a. Standpipes shall have permanent identification signs attached to the structure or dry standpipe in an approved location determined by the Director of Code Compliance and the Fire Chief.
- b. The approved sign shall read as follows:
“**This Dry Standpipe Serves the Automatic Sprinkler System” and/or
“Standpipe System” For (Insert Street Address) with ____PSI Required
at the Inlet to Deliver the System Demand for the Standpipe.”**



v. Fire Protection Equipment Identification Signage Requirements

- a. Rooms containing sprinkler riser control valves shall be identified for the use of the fire department. Rooms with exterior doors containing fire alarm control panels shall be identified for the use of the fire department. Such rooms shall be identified with permanent identification signs attached to the structure in an approved location determined by the Director of Code Compliance and the Fire Chief. Building address range added when applicable.
- b. Example of approved signs are as follows:
“**Sprinkler Control Valves / Fire Alarm Control Panel” or just “Sprinkler Control Valves”**



vi. Visual and Audible Alarm Requirements

- a. An approved exterior UL listed horn strobe notification appliance shall be installed 6 feet above finished grade over FDC's / standpipe connections.

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I. Truss Roof and Truss Floor Assembly Signs

i. Sign Construction Specifications

- a. Truss roof and/or truss floor signage shall be constructed of approved, durable materials, be colored with a red background with minimum 3" white letters. The shape of the emblem shall be an isosceles triangle and the size shall be no less than 12 inches horizontally by 6 inches vertically.

ii. Truss Roof and Truss Floor Signage Requirements

- a. Signs shall be affixed where a building or a portion thereof with truss construction is classified as Group A, B, E, F, H, I, M, R-1, R-2, R-4 or S occupancy shall have permanent identification signs attached to the structure in an approved location determined by the Director of Code Compliance and the Fire Chief.
- b. Truss signs for buildings, which utilize floor and/or roof assembly consisting of truss construction, are to be provided. A truss sign gives early warning to fire and emergency service members that the roof and/or floor may be subject to early collapse in the event of a fire condition.
- c. Examples of approved signs are as follows:



Building with Roof Truss Construction



Building with Floor Truss Construction



Building with Floor & Roof Truss Construction

J. Identification of Gas Piping in Buildings with Fire Sprinklers

i. Identification of Steel Gas Piping

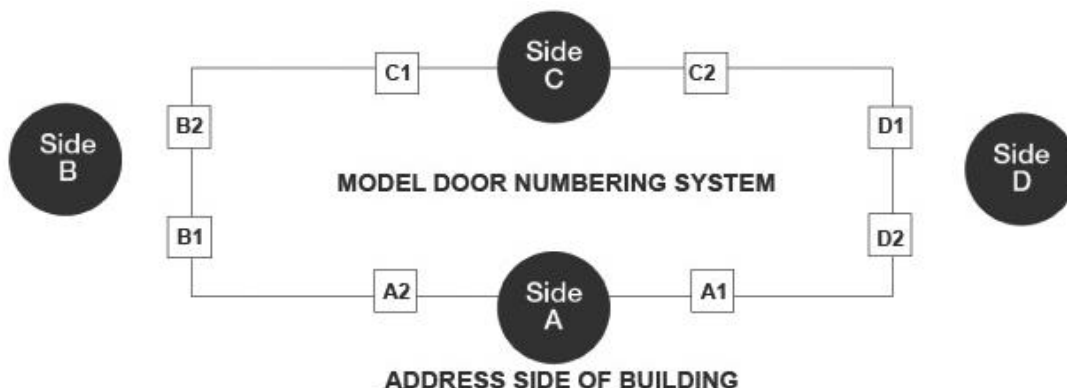
- a. In buildings with both steel gas piping and steel fire sprinkler piping, exposed gas piping, including piping above dropped ceilings, is to be identified to distinguish it from sprinkler piping.
 - i) Steel gas piping shall be identified with labels or stickers spaced at intervals not exceeding 5 feet.
 - ii) Steel gas piping labels/stickers are to be yellow in color marked "Gas" in black letters no less than 2 inches in height.

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K. Model Door Numbering System

- i. In an effort to provide emergency service personnel quick access to large buildings, buildings with a large number of occupants and buildings with a large number of exterior doors, the following *Model Door Numbering System* shall be implemented.
- ii. All **exterior doors** (not just side hinged doors) that allow access into and out of a building or tenant space shall be identified with a letter and number designator as described below.
 - a. Each side of the building will be assigned a letter designator with “A” assigned to the address side of the building typically where the main entrance would be located. Moving clockwise, each additional side will be given a letter designator – “B”, “C”, “D”, etc.
 - b. Doors are to be identified with the appropriate letter designator and door number. Door numbers will ascend from right to left. “A1”, “A2”, “A3” for the address side, “B1”, “B2”, “B3”, etc. for side B and so on.
 - c. Exterior door identifiers are to be no less than 3” high, permanent in nature, and of contrasting color to their background and located at the top right corner of the door or door frame.
 - d. Door identifiers are to be located on both the outside and inside of the doors.
 - e. **Interior Courtyards:** Doors into interior courtyards shall start with the letter designation “X” and correspond to building side they oppose, with the designation convention X1A, X1B and so on.
- iii. All exterior doors are to be identified in the following Use groups:
 - a. **Group E (Educational)**
 - b. **Group A (Assembly A-1, A-2, A-3 & A-4)**
 - c. **Group (H) High Hazard**
 - d. **Additional use groups based on size and complexity of specific buildings at the discretion of the Director of Code Compliance and Fire Chief.**



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L. Lock Box / Key Box Requirements

i. Lock Box Installation Requirements

- a. Lock boxes are to be installed in occupancies and in locations as specified by the currently adopted Fire Alarm Ordinance.

ii. SupraSafe Lock Box Specifications

- b. When lock boxes are to be installed, they are to be **SupraSafe 2HS/TS surface mounted box** or **SupraSafe 2HSR/TS recessed box**.

iii. Create account for Lock Box purchase at <https://lockbox.shopkidde.com/>

- a. Fire Department Name for account is **Manheim Township Fire Rescue**
- b. Choose either SupraSafe 2HS/TS (surface mount) or 2HSR/TS (recessed mount) with tamper switch option.



Supra Safe 2HSR/TS



Supra Safe 2HS/TS

* This Administrative Order replaces Administrative Order #90-5, #99-4, #2006-1, #2007-2, #2011-2, #2013-1 and Standard Design Bulletin #89-3



Issued By: _____

Andrew S. Bowman, Director of Code Compliance

Effective Date: _____

May 11, 2018

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