

## 1301:7-7-05 Fire service features.

### (A) Section 501 General

(1) **501.1 Scope.** Fire service features for buildings, structures and premises shall comply with this *rule*.

(2) **501.2 Permits.** A permit shall be required as set forth in *rule 1301:7-7-01 of the Administrative Code*.

(3) **501.3 Construction documents.** Construction documents for proposed fire apparatus access, location of fire lanes, security gates across fire apparatus access and construction documents and hydraulic calculations for fire hydrant systems shall be submitted to the fire department for review and approval prior to construction.

(4) **501.4 Timing of installation.** ~~When~~Where fire apparatus access roads or a water supply for fire protection ~~is~~are required to be installed, such protection shall be installed and made serviceable prior to and during the time of construction except when approved alternative methods of protection are provided. Temporary street signs shall be installed at each street intersection ~~when~~where construction of new roadways allows passage by vehicles in accordance with *paragraph (E)(2)(505.2) of this rule*.

### (B) Section 502 Definitions

(1) **502.1 Definitions.** The following ~~words and terms shall, for the purposes of this rule and as used elsewhere in this code, have the meanings shown herein~~ are defined in *rule 1301:7-7-02 of the Administrative Code*.

"Agency."

**"Fire apparatus access road."** ~~Same as "Fire Lane" as defined in this paragraph.~~

**"Fire command center."** ~~The principal attended or unattended location where the status of the detection, alarm communications and control systems is displayed, and from which the system(s) can be manually controlled.~~

**"Fire department master key."** ~~A limited issue key of special or controlled design to be carried by fire department officials in command which will open key boxes on specified properties.~~

**"Fire lane."** ~~A road or other passageway developed to allow the passage of fire apparatus. A fire lane is not necessarily intended for vehicular traffic other than fire apparatus. A fire lane shall not be interpreted to mean a residential and/or public street.~~

**"Key box."** ~~A secure device with a lock operable only by a fire department master key, and containing building entry keys and other keys that may be required for access in an emergency.~~

"Traffic calming devices."

### (C) Section 503 Fire apparatus access roads

(1) **503.1 Where required.** Fire apparatus access roads shall be provided and maintained in accordance with *paragraphs (C)(1)(a)(503.1.1) to (C)(1)(c) (503.1.3) of this rule*.

(a) **503.1.1 Buildings and facilities.** Approved fire apparatus access roads shall be provided for every facility, building or portion of a building hereafter constructed or moved into or within the jurisdiction *which are not readily accessible from a public and/or private street*. The fire apparatus access road shall comply with the requirements of this *paragraph* and shall extend to within 150 feet (45 720 mm) of all portions of the facility and all portions of the

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exterior walls of the first story of the building as measured by an approved route around the exterior of the building or facility.

**Exception/Exceptions:**

1. The fire code official is authorized to increase the dimension of 150 feet (45 720 mm) where any of the following conditions occur:

1.1. The building is equipped throughout with an approved automatic sprinkler system installed in accordance with paragraph (C)(3)(a)(i)(903.3.1.1), (C)(3)(a)(ii)(903.3.1.2) or (C)(3)(a)(iii)(903.3.1.3) of rule 1301:7-7-09 of the Administrative Code.

2.1.2. Fire apparatus access roads cannot be installed because of location on property, topography, waterways, nonnegotiable grades or other similar conditions, and an approved alternative means of fire protection is provided.

3.1.3. There are not more than two Group R-3 or Group U occupancies.

2. Where approved by the fire code official, fire apparatus access roads shall be permitted to be exempted or modified for solar photovoltaic power generation facilities.

(b) **503.1.2 Additional access.** The fire code official is authorized to require more than one fire apparatus access road based on the potential for impairment of a single road by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access.

(c) **503.1.3 High-piled storage.** Fire department vehicle access to buildings used for high-piled combustible storage shall comply with the applicable provisions of rule ~~1301:7-7-23~~1301:7-7-32 of the Administrative Code.

(2) **503.2 Specifications.** Fire apparatus access roads shall be installed and arranged in accordance with paragraphs (C)(2)(a)(503.2.1) to (C)(2)(h)(503.2.8) of this rule.

(a) **503.2.1 Dimensions.** Fire apparatus access roads shall have an unobstructed width of not less than 20 feet (6096 mm), exclusive of shoulders, except for approved security gates in accordance with paragraph (C)(6)(503.6) of this rule, and an unobstructed vertical clearance of not less than 13 feet 6 inches (4115 mm).

(b) **503.2.2 Authority.** The fire code official shall have the authority to require an increase in the minimum access widths where they are inadequate for fire or rescue operations or permit modifications to the required access widths where they are inadequate for fire or rescue operations or where necessary to meet the public safety objectives of the jurisdiction.

(c) **503.2.3 Surface.** Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be surfaced so as to provide all-weather driving capabilities.

(d) **503.2.4 Turning radius.** The required turning radius of a fire apparatus access road shall be determined by the fire code official.

(e) **503.2.5 Dead ends.** Dead-end fire apparatus access roads in excess of 150 feet (45 720 mm) in length shall be provided with an approved area for turning around fire apparatus.

(f) **503.2.6 Bridges and elevated surfaces.** Where a bridge or an elevated surface is part of a fire apparatus access road, the bridge shall be constructed and maintained in accordance with AASHTO HB-17 as listed in rule ~~1301:7-7-47~~ 1301:7-7-80 of the Administrative Code. Bridges and elevated surfaces shall be designed for a live load sufficient to carry the imposed loads of fire apparatus. Vehicle load limits shall be posted at both entrances to bridges when required by the fire code official. Where elevated surfaces designed for emergency vehicle use are adjacent to

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surfaces ~~which that~~ are not designed for such use, approved barriers, approved signs or both shall be installed and maintained ~~when where~~ required by the fire code official.

(g) **503.2.7 Grade.** The grade of the fire apparatus access road shall be within the limits established by the fire code official based on the fire department's apparatus.

(h) **503.2.8 Angles of approach and departure.** The angles of approach and departure for fire apparatus access roads shall be within the limits established by the fire code official based on the fire department's apparatus.

(3) **503.3 Marking.** Where required by the fire code official, approved signs or other approved notices or markings that include the words "NO PARKING-FIRE LANE" shall be provided for fire apparatus access roads to identify such roads or prohibit the obstruction thereof. The means by which fire lanes are designated shall be maintained in a clean and legible condition at all times and be replaced or repaired when necessary to provide adequate visibility.

(4) **503.4 Obstruction of fire apparatus access roads.** Fire apparatus access roads shall not be obstructed in any manner, including the parking of vehicles. The minimum widths and clearances established in *paragraph (C)(2)(a)(503.2.1) and (C)(2)(b)(503.2.2) of this rule* shall be maintained at all times.

(a) 503.4.1 Traffic calming devices. Traffic calming devices shall be prohibited unless approved by the fire code official.

(5) **503.5 Required gates or barricades.** The fire code official is authorized to require the installation and maintenance of gates or other approved barricades across fire apparatus access roads, trails or other accessways, not including public streets, alleys or highways. Electric gate operators, where provided, shall be listed in accordance with UL 325 as listed in rule ~~1301:7-7-47~~ 1301:7-7-80 of the Administrative Code. Gates intended for automatic operation shall be designed, constructed and installed to comply with the requirements of ASTM F 2200 as listed in rule ~~1301:7-7-47~~ 1301:7-7-80 of the Administrative Code.

(a) **503.5.1 Secured gates and barricades.** ~~When~~Where required, gates and barricades shall be secured in an approved manner. Roads, trails and other accessways that have been closed and obstructed in the manner prescribed by *paragraph (C)(5)(503.5) of this rule* shall not be trespassed on or used unless authorized by the owner and the fire code official.

**Exception:** The restriction on use shall not apply to public officers acting within the scope of duty.

(6) **503.6 Security gates.** The installation of security gates across a fire apparatus access road shall be approved by the fire chief. Where security gates are installed, they shall have an approved means of emergency operation. The security gates and the emergency operation shall be maintained operational at all times. Electric gate operators, where provided, shall be listed in accordance with UL 325 as listed in rule ~~1301:7-7-47~~ 1301:7-7-80 of the Administrative Code. Gates intended for automatic operation shall be designed, constructed and installed to comply with the requirements of ASTM F 2200 as listed in rule ~~1301:7-7-47~~ 1301:7-7-80 of the Administrative Code.

**(D) Section 504 Access to building openings and roofs**

(1) **504.1 Required access.** Exterior doors and openings required by this rule or the building code as listed in rule ~~1301:7-7-47~~ 1301:7-7-80 of the Administrative Code shall be maintained readily accessible for emergency access by the fire department. An approved access walkway leading from fire apparatus access roads to exterior openings shall be provided when required by the fire code official.

(2) **504.2 Maintenance of exterior doors and openings.** Exterior doors and their function shall not be eliminated without prior approval. Exterior doors that have been rendered nonfunctional and that retain a functional door exterior appearance shall have a sign affixed to the exterior side of the door with the words "THIS DOOR BLOCKED." The sign shall consist of letters having a principal stroke of not less than ¼ inch (19.1 mm) wide and ~~at least~~ not less

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than 6 inches (152 mm) high on a contrasting background. Required fire department access doors shall not be obstructed or eliminated. Exit and exit access doors shall comply with *rule 1301:7-7-10 of the Administrative Code*. Access doors for high-piled combustible storage shall comply with *paragraph ~~(F)(6)(a)(2306.6.1)~~(F)(6)(a)(3206.6.1) of rule ~~1301:7-7-23~~1301:7-7-32 of the Administrative Code*.

(3) **504.3 Stairway access to roof.** New buildings four or more stories in above grade plane, except those with a roof slope greater than four units vertical in 12 units horizontal (33.3-per cent slope), shall be provided with a stairway to the roof. Stairway access to the roof shall be in accordance with *paragraph ~~(I)(12)(1009.12)~~(K)(12)(1011.12) of rule 1301:7-7-10 of the Administrative Code*. Such stairway shall be marked at street and floor levels with a sign indicating that the stairway continues to the roof. Where roofs are used for roof gardens or for other purposes, stairways shall be provided as required for such occupancy classification.

**(E) Section 505 Premises identification**

(1) **505.1 Address numbers identification.** New and existing buildings shall ~~have be provided with~~ approved address numbers, building numbers or approved building identification placed in a position that is plainly identification. The address identification shall be legible and placed in a position that is visible from the street or road fronting the property. ~~These numbers~~Address identification characters shall contrast with their background. ~~Where required by the fire code official, address numbers shall be provided in additional approved locations to facilitate emergency response.~~Address numbers shall be Arabic numbers or alphabetical letters. ~~Numbers shall not be spelled out. Numbers-Each character~~ shall not be a minimum of less than 4 inches (~~101.6~~102 mm) high with a minimum stroke width of 0.51/2 inch (12.7 mm). ~~Where required by the fire code official, address identification shall be provided in additional approved locations to facilitate emergency response.~~ Where access is by means of a private road and the building cannot be viewed from the public way, a monument, pole or other sign or means shall be used to identify the structure. ~~Address identification shall be maintained.~~

(2) **505.2 Street or road signs.** Streets and roads shall be identified with approved signs. Temporary signs shall be installed at each street intersection when construction of new roadways allows passage by vehicles. Signs shall be of an approved size, weather resistant and be maintained until replaced by permanent signs.

**(F) Section 506 Key boxes**

(1) **506.1 ~~When~~Where required.** Where access to or within a structure or an area is restricted because of secured openings or where immediate access is necessary for life-saving or fire-fighting purposes, the fire code official is authorized to require a key box to be installed in an approved location. The key box shall be of an approved type listed in accordance with UL 1037 as listed in *rule 1301:7-7-80 of the Administrative Code*, and shall contain keys to gain necessary access as required by the fire code official.

(a) **506.1.1 Locks.** An approved lock shall be installed on gates or similar barriers ~~when~~where required by the fire code official.

**(b) 506.1.2 Key boxes for nonstandardized fire service elevator keys.** Key boxes provided for nonstandardized fire service elevator keys shall comply with *paragraph (F)(1)(506.1) of this rule* and all of the following:

(i) The key box shall be compatible with an existing rapid entry key box system in use in the jurisdiction and approved by the fire code official.

(ii) The front cover shall be permanently labeled with the words "Fire Department Use Only-Elevator Keys."

(iii) The key box shall be mounted at each elevator bank at the lobby nearest to the lowest level of fire department access.

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(iv) The key box shall be mounted 5 feet 6 inches (1676 mm) above the finished floor to the right side of the elevator bank.

(v) Contents of the key box are limited to fire service elevator keys. Additional elevator access tools, keys and information pertinent to emergency planning or elevator access shall be permitted where authorized by the fire code official.

(vi) In buildings with two or more elevator banks, a single key box shall be permitted to be used where such elevator banks are separated by not more than 30 feet (9144 mm). Additional key boxes shall be provided for each individual elevator or elevator bank separated by more than 30 feet (9144 mm).

Exception: A single key box shall be permitted to be located adjacent to a fire command center or the non-standard fire service elevator key shall be permitted to be secured in a key box used for other purposes and located in accordance with paragraph (F)(1)(506.1) of this rule.

(2) **506.2 Key box maintenance.** The operator of the building shall immediately notify the fire code official and provide the new key ~~when~~where a lock is changed or rekeyed. The key to such lock shall be secured in the key box.

**(G) Section 507 Fire protection water supplies**

(1) **507.1 Required water supply.** An approved water supply capable of supplying the required fire flow for fire protection shall be provided to premises upon which facilities, buildings or portions of buildings are hereafter constructed or moved into or within the jurisdiction.

(a) 507.1.1. Unobstructed access to water supplies shall be maintained at all times and fire department access to existing water supplies shall not be hindered in any manner.

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(2) **507.2 Type of water supply.** A water supply shall consist of reservoirs, pressure tanks, elevated tanks, water mains or other fixed systems capable of providing the required fire flow.

(a) **507.2.1 Private fire service mains.** Private fire service mains and appurtenances shall be installed in accordance with NFPA 24 as listed in rule ~~1301:7-7-47~~ 1301:7-7-80 of the Administrative Code.

(b) **507.2.2 Water tanks.** Water tanks for private fire protection shall be installed in accordance with NFPA 22 as listed in rule ~~1301:7-7-47~~ 1301:7-7-80 of the Administrative Code.

(3) **507.3 Fire flow.** Fire flow requirements for buildings or portions of buildings and facilities shall be determined by an approved method.

(4) **507.4 Water supply test.** The fire code official shall be notified prior to the water supply test. Water supply tests shall be witnessed by the fire code official or approved documentation of the test shall be provided to the fire code official prior to final approval of the water supply system.

(5) **507.5 Fire hydrant systems.** Fire hydrant systems shall comply with paragraphs (G)(5)(a)(507.5.1) to (G)(5)(f)(507.5.6) of this rule.

(a) **507.5.1 Where required.** Where a portion of the facility or building hereafter constructed or moved into or within the jurisdiction is more than 400 feet (122 m) from a hydrant on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building, on-site fire hydrants and mains shall be provided where required by the fire code official.

**Exceptions:**

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1. For Group R-3 and Group U occupancies, the distance requirement shall be 600 feet (183 m).
2. For buildings equipped throughout with an approved automatic sprinkler system installed in accordance with *paragraph (C)(3)(a)(i)(903.3.1.1) or (C)(3)(a)(ii) (903.3.1.2) of rule 1301:7-7-09 of the Administrative Code*, the distance requirement shall be 600 feet (183 m).

(i) 507.5.1.1 Hydrant for standpipe systems. Buildings equipped with a standpipe system installed in accordance with *paragraph (E)(905) of rule 1301:7-7-09 of the Administrative Code* shall have a fire hydrant within 100 feet (30 480 mm) of the fire department connections.

Exception: The distance shall be permitted to exceed 100 feet (30 480 mm) where approved by the fire code official.

(b) **507.5.2 Inspection, testing and maintenance.** Fire hydrant systems shall be subject to periodic tests as required by the fire code official. Fire hydrant systems shall be maintained in an operative condition at all times and shall be repaired where defective. Additions, repairs, alterations and servicing shall comply with approved standards. Records of tests and required maintenance shall be maintained.

(c) **507.5.3 Private fire service mains and water tanks.** Private fire service mains and water tanks shall be periodically inspected, tested and maintained in accordance with NFPA 25 as listed in rule ~~1301:7-7-47~~ 1301:7-7-80 of the *Administrative Code* at the following intervals:

- (i) Private fire hydrants ~~of all types~~: Inspection annually and after each operation; flow test and maintenance annually.
- (ii) Fire service main piping: Inspection of exposed, annually; flow test every 5 years.
- (iii) Fire service main piping strainers: Inspection and maintenance after each use.

Records of inspections, testing and maintenance shall be maintained.

(d) **507.5.4 Obstruction.** Unobstructed access to fire hydrants shall be maintained at all times. The fire department shall not be deterred or hindered from gaining immediate access to fire protection equipment or fire hydrants.

(e) **507.5.5 Clear space around hydrants.** A 3-foot (914 mm) clear space shall be maintained around the circumference of fire hydrants except as otherwise required or approved.

(f) **507.5.6 Physical protection.** Where fire hydrants are subject to impact by a motor vehicle, guard posts or other approved means shall comply with *paragraph (L)(312) of rule 1301:7-7-03 of the Administrative Code*.

#### (H) Section 508 Fire command center

(1) **508.1 Where required General.** Where required by other *paragraphs* of this code and in all buildings classified as high-rise buildings by the *building code as listed in rule ~~1301:7-7-47~~ 1301:7-7-80 of the Administrative Code*, a fire command center for fire department operations shall be provided and shall comply with *paragraphs (H)(1)(a)(508.1.1) to ~~(H)(1)(e)(508.1.5)(H)(1)(f)(508.1.6)~~ of this rule*.

(a) **508.1.1 Location and access.** The location and accessibility of the fire command center shall be approved by the fire code official.

(b) **508.1.2 Separation.** The fire command center shall be separated from the remainder of the building by not less than a 1-hour fire barrier constructed in accordance with section 707 of the *building code as listed in rule ~~1301:7-7-47~~ 1301:7-7-80 of the Administrative Code* or horizontal assembly constructed in accordance with section ~~712~~ 711 of the *building code as listed in rule ~~1301:7-7-47~~ 1301:7-7-80 of the Administrative Code*, or both.

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(c) **508.1.3 Size.** The fire command center shall be ~~a minimum of not less than~~ 200 square feet (19 m<sup>2</sup>) in area with a minimum dimension of 10 feet (3048 mm).

(d) **508.1.4 Layout approval.** A layout of the fire command center and all features required by this *paragraph* to be contained therein shall be submitted for approval prior to installation.

(e) 508.1.5 Storage. Storage unrelated to operation of the fire command center shall be prohibited.

(ef) ~~508.1.5~~508.1.6 Required features. The fire command center shall comply with NFPA 72 as listed in rule ~~1301:7-7-47~~ 1301:7-7-80 of the Administrative Code and shall contain the following features:

- (i) The emergency voice/alarm communication system control unit.
- (ii) The fire department communications system.
- (iii) Fire-detection and alarm system annunciator.
- (iv) Annunciator unit visually indicating the location of the elevators and whether they are operational.
- (v) Status indicators and controls for air distribution systems.
- (vi) The fire-fighter's control panel required by *paragraph* (l)(16)(909.16) of rule 1301:7-7-09 of the Administrative Code for smoke control systems installed in the building.
- (vii) Controls for unlocking stairway doors simultaneously.
- (viii) Sprinkler valve and water-flow detector display panels.
- (ix) Emergency and standby power status indicators.
- (x) A telephone for fire department use with controlled access to the public telephone system.
- (xi) Fire pump status indicators.
- (xii) Schematic building plans indicating the typical floor plan and detailing the building core, means of egress, fire protection systems, fire-fighter air-replenishment systems, fire-fighting equipment and fire department access, and the location of fire walls, fire barriers, fire partitions, smoke barriers and smoke partitions.

(xiii) An approved "Building Information Card" that includes, but is not limited to, all of the following information:

(a) General building information that includes: property name, address, the number of floors in the building above and below grade, use and occupancy classification (for mixed uses, identify the different types of occupancies on each floor) and estimated building population during the day, night, weekend;

(b) Building emergency contact information that includes: a list of the building's emergency contacts including but not limited to building manager, building engineer and their respective work phone number, cell phone number and e-mail address;

(c) Building construction information that includes: the type of building construction including but not limited to floors, walls, columns, and roof assembly;

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(d) Exit access stairway and exit stairway information that includes: number of exit access stairways and exit stairways in building, each exit access stairway and exit stairway designation and floors served; location where each exit access stairway and exit stairway discharges, interior exit stairways that are pressurized; exit stairways provided with emergency lighting; each exit stairway that allows reentry; exit stairways providing roof access; elevator information that includes: number of elevator banks, elevator bank designation, elevator car numbers and respective floors that they serve; location of elevator machine rooms, control rooms and control spaces; location of sky lobby; and location of freight elevator banks;

(e) Building services and system information that includes: location of mechanical rooms, location of building management system, location and capacity of all fuel oil tanks, location of emergency generator and location of natural gas service;

(f) Fire protection system information that includes: locations of standpipes, location of fire pump room, location of fire department connections, floors protected by automatic sprinklers and location of different types of automatic sprinkler systems installed including but not limited to dry, wet, and pre-action;

(g) Hazardous material information that includes: location and quantity of hazardous material.

~~(xiv)~~ Work table.

~~(xv)~~ Generator supervision devices, manual start and transfer features.

~~(xvi)~~ Public address system, where specifically required by other paragraphs of this code.

~~(xvii)~~ Elevator fire recall switch in accordance with ASME A17.1 as listed in rule 1301:7-7-47 1301:7-7-80 of the Administrative Code.

~~(xviii)~~ Elevator emergency or standby power selector switch(es), where emergency or standby power is provided.

**(I) Section 509 Fire protection and utility equipment identification and access**

**(1) 509.1 Identification.** Fire protection equipment shall be identified in an approved manner. Rooms containing controls for air conditioning systems, sprinkler risers and valves, or other fire detection, suppression or control elements shall be identified for the use of the fire department. Approved signs required to identify fire protection equipment and equipment location shall be constructed of durable materials, permanently installed and readily visible.

(a) 509.1.1 Utility identification. Where required by the fire code official, gas shutoff valves, electric meters, service switches and other utility equipment shall be clearly and legibly marked to identify the unit or space that it serves. Identification shall be made in an approved manner, readily visible and shall be maintained.

**(2) 509.2 Equipment access.** Approved access shall be provided and maintained for all fire protection equipment to permit immediate safe operation and maintenance of such equipment. Unobstructed access to fire protection equipment shall be maintained at all times. Storage, trash and other materials or objects shall not be placed or kept in such a manner that would prevent such equipment from being readily accessible.

**(J) Section 510 Emergency responder radio coverage**

**(1) 510.1 Emergency responder radio coverage in new buildings.** All new buildings shall have approved radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building. This paragraph shall not require improvement of the existing public safety communication systems.

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**Exceptions:**

1. Where approved by the building official and the fire code official, a wired communication system in accordance with *paragraph (G)(2)(m)(ii)(907.2.13.2) of rule 1301:7-7-09 of the Administrative Code* shall be permitted to be installed or maintained in lieu of an approved radio coverage system.

2. Where it is determined by the fire code official that the radio coverage system is not needed.

3. In facilities where emergency responder radio coverage is required and such systems, components or equipment required could have a negative impact on the normal operations of that facility, the fire code official shall have the authority to accept an automatically activated emergency responder radio coverage system.

(2) 510.2 Emergency responder radio coverage in existing buildings. Existing buildings shall be provided with approved radio coverage for emergency responders as required in *rule 1301:7-7-11 of the Administrative Code*.

(3) 510.3 Permit required. A construction permit for the installation of or modification to emergency responder radio coverage systems and related equipment is required as specified in *paragraph (E)(7)(e)(105.7.5) of rule 1301:7-7-01 of the Administrative Code*. Maintenance performed in accordance with this code is not considered a modification and does not require a permit.

(4) 510.4 Technical requirements. Systems, components and equipment required to provide emergency responder radio coverage system shall comply with *paragraphs (J)(4)(a)(510.4.1) to (J)(4)(b)(v)(510.4.2.5) of this rule*.

(2) 510.2 - (a) 510.4.1 Radio signal strength. The building shall be considered to have acceptable emergency responder radio coverage when signal strength measurements in 95 per cent of all areas on each floor of the building meet the signal strength requirements in *paragraphs (J)(2)(a)(510.2.1) (J)(4)(a)(i)(510.4.1.1) and (J)(4)(a)(ii)(510.4.1.2) of this rule*.

(a) 510.2.1 - (i) 510.4.1.1 Minimum signal strength into the building. A minimum signal strength of -95 dBm shall be receivable within the building.

(b) 510.2.2 - (ii) 510.4.1.2 Minimum signal strength out of the building. A minimum signal strength of -100~~95~~ dBm shall be received by the agency's radio system when transmitted from within the building.

(3) 510.3 Emergency responder radio coverage in existing buildings. Existing buildings that do not have approved radio coverage for emergency responders within the building shall be equipped with such coverage according to one of the following:

(a) Wherever existing wired communication system cannot be repaired or is being replaced, or where not approved in accordance with *paragraph (J)(1)(510.1), exception 1 of this rule*.

(b) Within a time frame established by the adopting authority.

(b) 510.4.2 System design. The emergency responder radio coverage system shall be designed in accordance with *paragraphs (J)(4)(b)(i)(510.4.2.1) to (J)(4)(b)(v)(510.4.2.5) of this rule*.

(i) 510.4.2.1 Amplification systems allowed. Buildings and structures that cannot support the required level of radio coverage shall be equipped with a radiating cable system, a distributed antenna system with "Federal Communications Commission" ("FCC")-certified signal boosters, or other system approved by the fire code official in order to achieve the required adequate radio coverage.

(ii) 510.4.2.2 Technical criteria. The fire code official shall maintain a document providing the specific technical information and requirements for the emergency responder radio coverage system. This document shall contain, but not be limited to, the various frequencies required, the location of radio sites, effective radiated power of radio sites, and other supporting technical information.

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(iii) 510.4.2.3 Standby power. Emergency responder radio coverage systems shall be provided with standby power in accordance with paragraph (D)(604) of rule 1301:7-7-06 of the Administrative Code. The standby power supply shall be capable of operating the emergency responder radio coverage system for a duration of not less than 24 hours.

(iv) 510.4.2.4 Signal booster requirements. If used, signal boosters shall meet the following requirements:

(a) All signal booster components shall be contained in a "National Electrical Manufacturer's Association" ("NEMA") 4-type waterproof cabinet.

(b) Battery systems used for the emergency power source shall be contained in a "NEMA" 4-type waterproof cabinet.

(c) The signal booster system and battery system shall be electrically supervised and monitored by a supervisory service, or when approved by the fire code official, shall sound an audible signal at a constantly attended location.

(d) Equipment shall have "FCC" certification prior to installation.

(v) 510.4.2.5 Additional frequencies and change of frequencies. The emergency responder radio coverage system shall be capable of modification or expansion in the event frequency changes are required by the "FCC" or additional frequencies are made available by the "FCC."

(5) 510.5 Installation requirements. The installation of the public safety radio coverage system shall be in accordance with paragraphs (J)(5)(a)(510.5.1) to (J)(5)(d)(510.5.4) of this rule.

(a) 510.5.1 Approval prior to installation. Amplification systems capable of operating on frequencies licensed to any public safety agency by the "FCC" shall not be installed without prior coordination and approval of the fire code official.

(b) 510.5.2 Minimum qualifications of personnel. The minimum qualifications of the system designer and lead installation personnel shall include both of the following:

(i) A valid FCC-issued general radio operators license.

(ii) Certification of in-building system training issued by a nationally recognized organization, school or a certificate issued by the manufacturer of the equipment being installed.

These qualifications shall not be required where demonstration of adequate skills and experience satisfactory to the fire code official is provided.

(c) 510.5.3 Acceptance test procedure. Where an emergency responder radio coverage system is required, and upon completion of installation, the building owner shall have the radio system tested to verify that two-way coverage on each floor of the building is not less than 90 per cent. The test procedure shall be conducted as follows:

(i) Each floor of the building shall be divided into a grid of 20 approximately equal test areas.

(ii) The test shall be conducted using a calibrated portable radio of the latest brand and model used by the agency talking through the agency's radio communications system.

(iii) Failure of ~~not~~ more than two nonadjacent test areas shall ~~not~~ result in failure of the test.

(iv) In the event that three of the test areas fail the test, in order to be more statistically accurate, the floor shall be permitted to be divided into 40 equal test areas. Failure of ~~not~~ more than four nonadjacent test areas shall ~~not~~ result

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in failure of the test. If the system fails the 40-area test, the system shall be altered to meet the 90 per cent coverage requirement.

(v) A test location approximately in the center of each test area shall be selected for the test, with the radio enabled to verify two-way communications to and from the outside of the building through the public agency's radio communications system. Once the test location has been selected, that location shall represent the entire test area. Failure in the selected test location shall be considered failure of that test area. Additional test locations shall not be permitted.

(vi) The gain values of all amplifiers shall be measured and the test measurement results shall be kept on file with the building owner so that the measurements can be verified during annual tests. In the event that the measurement results become lost, the building owner shall be required to rerun the acceptance test to reestablish the gain values.

(vii) As part of the installation a spectrum analyzer or other suitable test equipment shall be utilized to ensure spurious oscillations are not being generated by the subject signal booster. This test shall be conducted at the time of installation and subsequent annual inspections.

(d) 510.5.4 "FCC" compliance. The emergency responder radio coverage system installation and components shall also comply with all applicable federal regulations including, but not limited to, FCC 47 CFR Part 90.219 as listed in rule 1301:7-7-80 of the Administrative Code.

(6) 510.6 Maintenance. The emergency responder radio coverage system shall be maintained operational at all times in accordance with paragraphs (J)(6)(a)(510.6.1) to (J)(6)(c)(510.6.3) of this rule.

(a) 510.6.1 Testing and proof of compliance. The emergency responder radio coverage system shall be inspected and tested annually or where structural changes occur including additions or remodels that could materially change the original field performance tests. Testing shall consist of the following:

(i) In-building coverage test as described in paragraph (J)(5)(c)(510.5.3) of this rule.

(ii) Signal boosters shall be tested to verify that the gain is the same as it was upon initial installation and acceptance.

(iii) Backup batteries and power supplies shall be tested under load of a period of 1 hour to verify that they will properly operate during an actual power outage. If within the 1-hour test period the battery exhibits symptoms of failure, the test shall be extended for additional 1-hour periods until the integrity of the battery can be determined.

(iv) Other active components shall be checked to verify operation within the manufacturer's specifications.

(v) At the conclusion of the testing, a report, which shall verify compliance with paragraph (J)(5)(c)(510.5.3) of this rule, shall be submitted to the fire code official.

(b) 510.6.2 Additional frequencies. The building owner shall modify or expand the emergency responder radio coverage system at his or her expense in the event frequency changes are required by the "FCC" or additional frequencies are made available by the "FCC." Prior approval of the public safety radio coverage system on previous frequencies does not exempt this paragraph.

(c) 510.6.3 Field testing. Agency personnel shall have the right to enter onto the property at any reasonable time to conduct field testing to verify the required level of radio coverage.

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