

17 FIRE PROTECTION V17000

17.1 GENERAL

17.1.1 Description

This section identifies minimum requirements that shall be met for all mechanical and plumbing applications in the design and construction of elements for Arlington County Building Design Standards.

17.1.2 Related Arlington County Standards, Specification and Policies

including, but not limited to, those listed in Table 17.1.2

Table 17.1.2
EPA Energy Star®
Arlington County Code - Chapter 8.1 - Fire Prevention Code – April 28, 2009 (Arlington County Fire Prevention Code)
Arlington County Policy for Integrated Facility Sustainability - August 19, 2008 ("Green Building" Policy)
Building Design – Vertical Infrastructure, Chapter 16 - ELECTRICAL - V16000 (see pg. 16-69)
Arlington County Construction Standards and Specifications – 02550 Water Mains and Appurtenances

17.1.3 Applicable Standards and Specifications

including, but not limited to, those listed in Table 17.1.3

Table 17.1.3
Code of Virginia
EPA Energy Star®
National Fire Protection Association (NFPA)
US Green Building Council’s Leadership in Energy and Environmental Design (LEED) green building rating system
Virginia Statewide Fire Prevention Code
Virginia Uniformed Statewide Building Code 2012 (USBC)

17.1.4 Quality Assurance

17.1.4.1 Reserved

17.1.5 Submittals

17.1.5.1 Reserved

17.2 DESIGN

17.2.1 Fire Protection

17.2.1.1 Sprinkler Systems shall be designed, installed, and tested in accordance with all applicable codes and reviewed and approved by the Contractor.

- 17.2.1.2 The inspectors test valve shall be located in a readily accessible location. Provisions for discharging the water during the cyclic system test shall be made by piping the drain to the exterior of the Building.
- 17.2.1.3 Sprinkler devices, valves, etc., shall be permanently tagged noting the device and its purpose. Valves or devices that are located above accessible ceilings should be marked at the ceiling level indicating a device or valve above.
- 17.2.1.4 Dry sprinkler valves shall be installed so that a proper test, reset, and maintenance can be performed from one location. Use of dry type sprinkler systems is discouraged due to maintenance requirements.
- 17.2.1.5 The Contractor shall provide attic stock sprinkler heads and spare sprinkler head wrenches.
- 17.2.1.6 Key Box

Where required for the purpose of fire department entry, all Buildings shall provide a key box to be installed on the exterior of Building in an approved location by fire official with the exception of properties located in County designed R-5 zoning districts in accordance with Table 17.2.1.6.

Table 17.2.1.6 Key Box
Key Box – Building Interior: recessed mounted on Building and contain Building entrance keys.
Key Box – Building Exterior: Shall be located adjacent to the primary fire department entrance or entrance nearest to the fire control room. The <u>Key Box</u> shall be flush mounted no higher than 48 inches to the bottom of the box from the finished floor elevation. The key boxes must be visible and accessible and shall be installed prior to occupancy.
<p>Keys: In Buildings with fire command centers Fifteen (15) sets of common keys, which shall be located in a Key Box in the fire control room shall be provided. The keys are required for access to Building services and systems and to all storage, trash, and utility rooms, roof access doors, and doors to other secured areas.</p> <p>In all other Buildings without fire command centers: Seven (7) sets of common keys shall be provided in a Key Box placed in an interior location of the Building must be coordinated with and approved by the Arlington County Project Officer at the design phase of the project. Individual keys shall be clearly labeled as to use/function and each set of keys shall be individually tagged.</p>

- 17.2.1.7 **Operations Procedure Manual:** All structures with a fire control room or other structures as required by the County shall have an Operations Procedure Manual. The County shall approve the contents and location of the manual and the owner shall maintain the manual and update it whenever necessary.

17.2.2 Fire Alarm System

- 17.2.2.1 The installer of the fire alarm and Fire Suppression Systems shall provide the County with the following items in accordance with Table 17.2.2.1 at the time of acceptance of the system.

Table 17.2.2.1 Owner’s Project Requirements for Fire Alarm System
Three (3) complete sets of Operation and Maintenance manuals
Parts manuals and list of local vendors for the system
Six (6) set of fire alarm system keys to cabinets and panels and manual stations
As-built drawings
As-built schematic diagrams & wiring diagrams
Any access codes
Electronic copy of programming of addressable panels

- 17.2.2.2 The installer shall maintain the color-coding established by the manufacturer throughout the system. The terminations or connections in the control panels or junction points should be clearly marked and the corresponding field wiring should be permanently tagged.
- 17.2.2.3 Fire alarm devices, control panel and annunciator panel must be from the same manufacturer.
- 17.2.2.4 The Fire Alarm Annunciator Panel (FAAP) shall be located adjacent to the primary fire department entrance.
- 17.2.2.5 All fire alarm devices shall be readily accessible for testing, repair and maintenance purposes. All fire alarm devices located above a suspended ceiling must be clearly labeled at the ceiling.
- 17.2.2.6 Smoke alarms shall be installed in structures as required by the Virginia Uniformed Statewide Building Code 2012 (USBC) and NFPA.
- 17.2.2.7 Dedicated Plain Ordinary Telephone Service (POTS) outlets are required for each auto-dialer and shall be labeled to indicate use.
- 17.2.2.8 The phone lines serving the auto-dialers shall not be hard wired; a jack shall be provided for each line to facilitate maintenance and testing.
- 17.2.2.9 Auto-dialer program and format codes shall be provided to the County at the acceptance of the system and a copy shall be included in the operations manual for the fire alarm system.
- 17.2.2.10 Projects, requiring an elevator shall be provided with a POTS outlet and be labeled to indicate use and shall not serve any other equipment.
- 17.2.2.11 The Fire Alarm Control Panel (FACP) and the FAAP, and auto-dialer shall be programmed and or designed to automatically reset once a trouble or fault is cleared.
- 17.2.2.12 The auto-dialers shall be programmed to monitor/report events.
- 17.2.2.13 The auto-dialer test timer test shall be programmed to perform between 6:00 A.M. and 8:00 A.M.

- 17.2.2.14 The Contractor shall arrange to receive and respond to all trouble and alarms received by the County's monitoring service prior to a building being issued a certificate of occupancy by the County.
- 17.2.2.15 The Contractor shall be responsible for paying for all fees associated with review, approval and permitting.
- 17.2.2.16 All Fire Alarm Control Panels, Auto Dialers shall have external surge suppression to protect the systems from lightning and voltage surges both from the line voltage and the phone lines.
- 17.2.2.17 Duct detector locations shall be readily accessible, and provided with an access panel for routine service and testing.
- 17.2.2.18 The name, telephone number, and account number of the current central station monitoring company shall be posted and maintained inside the FACP. If the fire alarm system is not monitored, that fact shall be posted and maintained inside the FACP.

17.2.3 Fire Department Access

- 17.2.3.1 Access for emergency vehicles shall be provided to within one hundred and fifty feet (150') of the main or principal entrance of every Building. The fire department vehicular access may be provided by a public or private street, parking lot, and/or fire lanes.
- 17.2.3.2 When Buildings are more than five (5) stories or fifty feet (50') in height, ladder truck access shall be provided to both the front and rear of the Building.
- 17.2.3.3 The access to the rear may be provided via a street, parking lot, or fire lane.
- 17.2.3.4 The inner edge of the ladder truck access way shall be no less than sixteen feet (16') and no more than thirty (30') from the exterior Building wall.
- 17.2.3.5 When fire lanes are required, they shall have a minimum width of twenty feet (20'). Fire lanes shall have curb painting and signage.
- 17.2.3.6 Emergency vehicle access ways which are over one hundred and fifty feet (150') in length and which do not accommodate through traffic shall provide adequate space for turning apparatus around. (Due to the size of the ladder truck, it is suggested that guidance be obtained from the Fire Prevention Office to determine adequate turnaround dimensions).
- 17.2.3.7 A twelve foot (12') wide access lane to within fifty feet (50') of the edge of swimming pools, with an eight foot (8') personnel gate in the fence at the point of access is required except for individually owned pools located on single family lots.
- 17.2.3.8 Emergency vehicle access ways shall accommodate a fourteen foot (14') vehicle without any obstructions including piping, conduit, lighting, signage, sprinklers, Building structure and wires, etc. Designers shall consider vertical curvature when determining these clearances.
- 17.2.3.9 Fire department vehicle access for ladder trucks shall be designed to support a 75,000 lb. (28,125 kg) vehicle and all outrigger (pad) point loads or for a nominal 450 lb./sf (21.5 kPa) uniform live load. Calculations shall be provided by a PE licensed in Virginia.

17.2.4 Fire Lanes and Signage

- 17.2.4.1 The Arlington County Code requires the installation of fire lanes as part of the public utilities requirements. The Arlington County Fire Prevention Code governs the dedication of the fire lane as well as the installation and sign specifications.
- 17.2.4.2 All fire lanes and locations of signs shall be marked on the site plan.
- 17.2.4.3 Fire Lane Designation
Under Chapter 8.1 – Section 503 of the Arlington County Code, the Office of the Arlington County Fire Department is authorized to designate fire lanes where necessary, for the purpose of preventing parking in front of, or adjacent to, *Fire Hydrants*, fire department connections and to ensure access to Buildings and structures for firefighting and rescue apparatus and in accordance with Table 17.2.4.3.

Table 17.2.4.3 Owner’s Project Requirements for Fire Lane Designation
Fire lanes shall have a minimum width of twenty feet (20’).
Fire lanes shall be installed where required by the Office of the Arlington County Fire Department. Fire lanes shall be marked with both sign and curb delineation.
Fire lanes may be used for temporary stopping or standing
Gates and barricades that are installed across a fire apparatus access road normally intended for vehicular traffic shall be installed with a fire department access system including an emergency override fire department master key switch as approved by the fire official.

17.2.5 Markings and Signs

- 17.2.5.1 Markings and signs shall meet the specifications as detailed under Chapter 8.1 – Section 503 of the Arlington County Code.

17.2.6 Location

- 17.2.6.1 Signs or markings shall be placed as follows:
 - 17.2.6.1.1 Where fire lanes run through parking areas where there is no adjacent curbing and posting of a sign is not practical, "NO PARKING FIRE LANE" may be required to be painted on the pavement in letters at least two feet (2’) high.
 - 17.2.6.1.2 Signs shall be provided at intervals of seventy-five feet (75’) with the bottom of the sign no less than seven feet (7’) from the ground unless otherwise directed by the code official.
 - 17.2.6.1.3 Curbing shall be painted within the limits of the fire lane as approved by the Arlington County Fire Department.
 - 17.2.6.1.4 When curbing is not provided, a yellow line may be required to be painted on the pavement along the perimeter and within the limits of the fire lane.

17.2.7 Hydrants and Fire Connections

- 17.2.7.1 The placement of *Fire Hydrants* requires plan approval from the Department of Environmental Services (DES).

- 17.2.7.2 All fire hydrants shall be installed in accordance with the Arlington County Construction Standards and Specifications – 02550 Water Mains and Appurtenances.
- 17.2.7.3 A minimum of ten feet (10’) clear around fire department connections and four feet (4’) around Fire Hydrants shall be maintained and shall not be obstructed by trees, shrubs, plants, structures or any other objects.
- 17.2.7.4 Fire department connections shall be located on the street front, address side of Buildings and shall be visible and accessible from the street.
- 17.2.7.5 Fire Hydrants shall be located within seventy-five feet (75’) of the fire department connections.
- 17.2.7.6 No Parking space shall be provided within fifteen feet (15’) of a Fire Hydrant located along the curb line or edge of any public or private roadway.
- 17.2.7.7 Fire Hydrants installed in parking lots shall be located within a fire lane. Provide necessary curb and/or roadway marking as required.
- 17.2.7.8 Fire Hydrants shall be located to minimize the impacts to on street curb space use. When possible hydrants may be placed in areas where on street parking would be restricted for other reasons, such as near a corner or driveway. Fire Hydrants adjacent to curb extensions curb bulbs and nubs may be placed in the extension, bulb or nub to minimize the loss of on street parking.

17.3 PRODUCTS

17.3.1 FIRE ALARM SYSTEM

Brand Name(s) for Building Element in accordance with Table 17.3.1 The Specification shall identify a minimum of three (3) Brand Names (manufactures) that comply with the Owner’s Project Requirements used for the Invitation to Bid, unless the Brand Name Category listed as No Substitutions.

<i>Table 17.3.1</i> <i>Brand Name Product(s) for the FIRE ALARM SYSTEM</i>		
<i>Building Element</i>	<i>Brand Name(s)</i> <i>Brand Name Model</i>	<i>Brand Name -</i> <i>Category</i>
Fire Alarm Devices, control panels, and annunciator	Edwards, Firelite, Notifier and Silent Knight	No Substitutions
Key Box	KNOX-BOX®	No Substitutions
	<i>3200 Series^a</i>	

Note^a The KNOX-BOX® is the recognized Key Box by the Arlington County Fire Department. The Contractor through the KNOX-BOX® website at <http://www.knoxbox.com/> obtains the Key Box. The website requests the jurisdiction (enter zip code) which the box will be located and keyed to that jurisdiction.

PANELS

17.3.2 Fire Alarm Annunciator Panels

- 17.3.2.1 Only listed graphic Fire Alarm Annunciator Panels as identified in the NFPA shall be installed.
- 17.3.2.2 The basis for textural display of room numbers on the Fire Alarm Annunciator Panel shall be compliance with the Room Numbering Standard in Section 1.2.10 Document Organization and Format Table 1.2.10.1, page 1-6.

17.3.3 Fire Alarm Control Panel

All devices connected to the Fire Alarm Control Panel (FACP) shall be by the manufacturer of the FACP.