

UNIFIED FIRE AUTHORITY FIRE PREVENTION BUREAU

Fire Apparatus Access, Dead-Ends Road Grade, Road Width, Turn-a-Round, Gate Width and Lock Box

5/15/2010



[This document shall assist in the process of understanding the fire code and appendices applicable to required fire department access, including but not limited to turn-a-round widths, gates width, lock box requirements etc .]

Road Grade, Road Width, Turn-a-Round, Gate Width and Lock Box

The Unified Fire Authority will use the following Tables and items listed and illustrated below.

Driveways

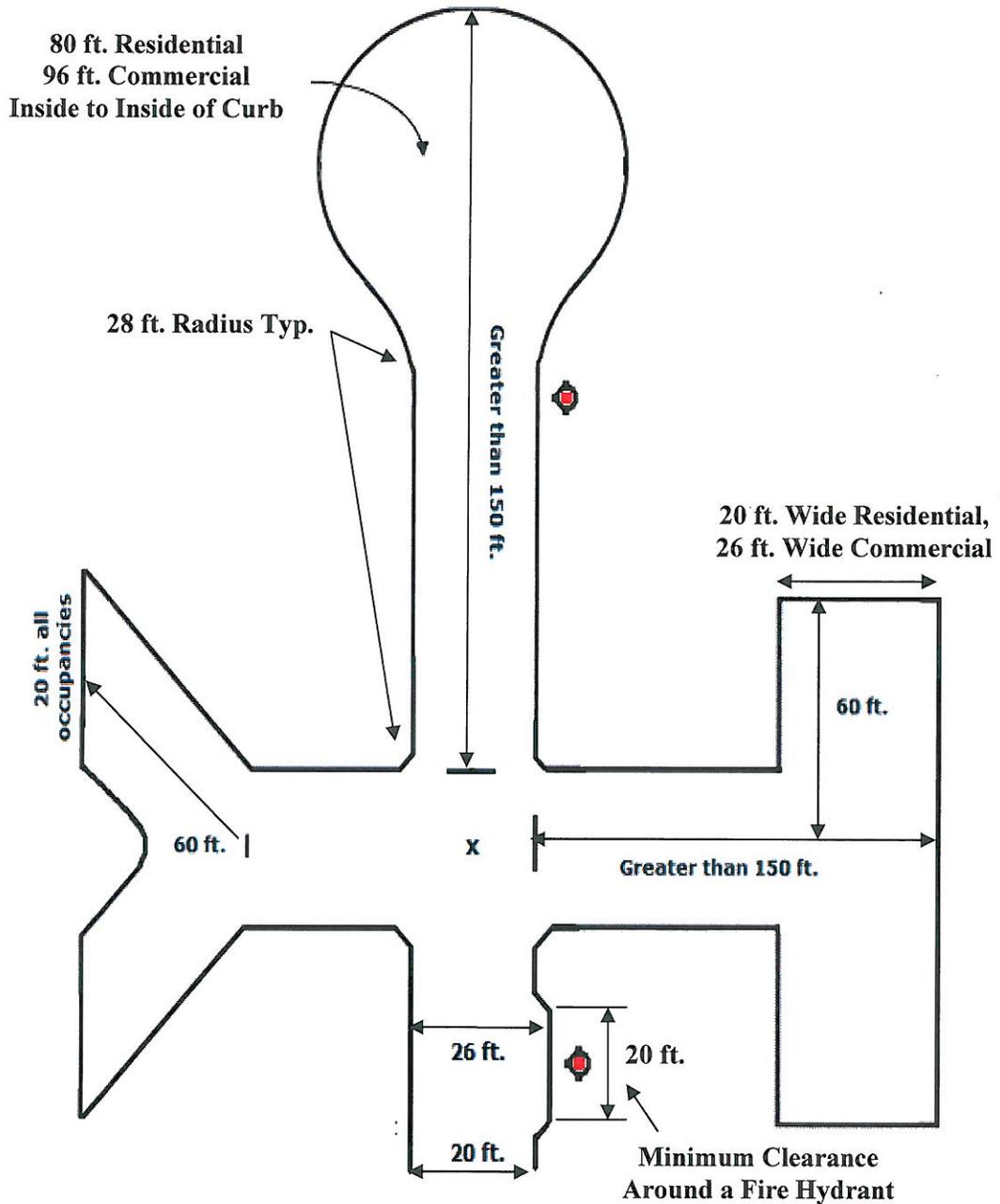
Defined as access points to a structure as measured from the inside curb of the main street serving the structure to the front most edge of the physical structure regardless of construction type, size or location. Driveways in excess of 150 feet require an approved fire department turnaround that complies with Table D103.4 of the International Fire Code.

TABLE D103.4 REQUIREMENTS FOR DEAD-END FIRE APPARATUS ACCESS ROADS		
<u>LENGTH (feet)</u>	<u>WIDTH (feet)</u>	<u>TURNAROUNDS REQUIRED</u>
0–150	20	None required
151–500	20	120-foot Hammerhead, 60-foot “Y” or 96-foot-diameter cul-de-sac in accordance with Figure D103.1
501–750	26	120-foot Hammerhead, 60-foot “Y” or 96-foot-diameter cul-de-sac in accordance with Figure D103.1
Over 750		Special approval required

Additional Requirements

1. 13’ 6” height clearance
2. All weather access as determined by fire code official.
3. 12% maximum grade in Draper City only, all other areas 10%.
4. No dead ends greater than 150’ with out a turnaround.
5. No dead ends greater than 200’ without a turnaround and a turnout.
6. Vehicle load limits posted for bridges to driveways and private roads designed to accommodate 75,000 lbs minimum. (D 102.1)

Required Dimensions for Fire Department Turnaround



Note: IFC D103.4 Dead ends. Dead-end fire apparatus access roads in excess of 150 feet shall be provided with width and turnaround provisions in accordance with Table D103.4.

D105.2 Width for Aerial Apparatus. Aerial fire apparatus access roads shall have a minimum unobstructed width of 26 ft. exclusive of shoulders, in the immediate vicinity of any building or portion of buildings more than 30 ft. in height.



IFC 503.2.1 Dimensions. Fire apparatus access roads shall have an unobstructed width of not less than 20 feet (26 ft. for commercial property with fire hydrants) except for approved security gates in accordance with Section 503.6. (Where a security gate is installed the Unified Fire Authority requires gate width to be at least 18 - 20 feet wide, with the least dimension being 12 feet in width for two gates). An unobstructed vertical clearance of not less than 13 feet 6 inches is required.

IFC 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.

IFC D106 Multiple-Family Residential Developments. Projects having more than 100 dwelling units shall be equipped throughout with two separate and approved fire apparatus access roads. Projects having up to 200 dwelling units may have a single approved fire apparatus access road when all buildings, including nonresidential occupancies, are equipped throughout with automatic fire sprinklers.

IFC D106.2 Projects having more than 200 dwelling units. Multiple family residential projects having more than 200 dwelling units shall be provided with two separate and approved fire apparatus access roads regardless of whether they are equipped with an approved automatic sprinkler system.

IFC D107.1 One or two family dwelling residential developments. Developments of one or two family dwellings where the number of dwelling units exceeds 30 shall be provided with separate and approved fire apparatus access roads and shall meet the requirements of Section D104.3 **Note:** Access roads shall be placed a distance apart equal to not less than one half of the length of the maximum overall diagonal dimension of the property or areas to be served, measured in a straight line between accesses. When there are practical difficulties, i.e. canals, freeways, limited property size etc. in the way of carrying out the strict letter of the code, one way in and out can be approved by the code official. As a suitable alternate for two access roads, increased fire flow, increased road width or residential fire sprinklers may be used as a suitable alternative to two access roads.

IFC D104.1 Buildings exceeding three stories or 30 feet in height. Buildings or facilities exceeding 30 feet or three stories in height shall have at least three means of fire apparatus access for each structure.

D104.2 Buildings exceeding 62,000 square feet in area. Buildings or facilities having a gross building area of more than 62,000 square feet (5760 m²) shall be provided with two separate and approved fire apparatus access roads.

Exception: Projects having a gross building area of up to 124,000 square feet (11 520 m²) that have a single approved fire apparatus access road when all buildings are equipped throughout with approved automatic sprinkler systems.

D104.3 Remoteness. Where two access roads are required, they shall be placed a distance apart equal to not less than one half of the length of the maximum overall diagonal dimension of the property or area to be served, measured in a straight line between accesses.

IFC 503.2.1 Dimensions. Fire apparatus access roads shall have an unobstructed width of not less than 20 feet except *exclusive of shoulders except* for approved security gates in accordance with Section 503.6. (Where a security gate is installed the Unified Fire Authority requires gate width to be at least 18 - 20 feet wide, with the least dimension being 12 feet in width for two gates). An unobstructed vertical clearance of not less than 13 feet 6 inches is required.

IFC 503.2.2 Authority. The code official shall have the authority to require an increase in the minimum access widths where they are inadequate for fire or rescue operations.

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. (In the Unified Fire Authority jurisdiction, a minimum 75-thousand pound road base/weight capacity is required). (D102.1)

IFC 503.2.4 Turning radius. A required turning radius of 28 feet for fire apparatus access road is required. (Fig. D103.1)

503.2.5 Dead ends. Dead-end fire apparatus access roads in excess of 150 feet in length shall be provided with an approved area for turning around fire apparatus. (See D103.4)

IFC 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, Standard Specification for Highway Bridges. Bridges and elevated surfaces shall be designed for a live load sufficient to carry the imposed loads of fire apparatus (**70 ton**). Vehicle load limits shall be posted at both entrances to bridges where required by the code official. Where elevated surfaces designed for emergency vehicle use are adjacent to surfaces which are not designed for such use, approved barriers, approved signs or both shall be installed and maintained when required by the code official.

IFC 503.2.7 Grade. The grade of the fire apparatus access road (10%) shall be within the limits established by the code official based on the fire department's apparatus. (D103.2) Note: Exception for Draper City that has an ordinance to allow 12%.

IFC 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 departments apparatus. In the majority of cases this will be determined by the Area Fire Inspector in conjunction with the City/County Planning Department and the State Department of Transportation.

IFC 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.



Signs are 12 X 18 inches, metal, and/or made of all weather resistant materials. (D103.6)

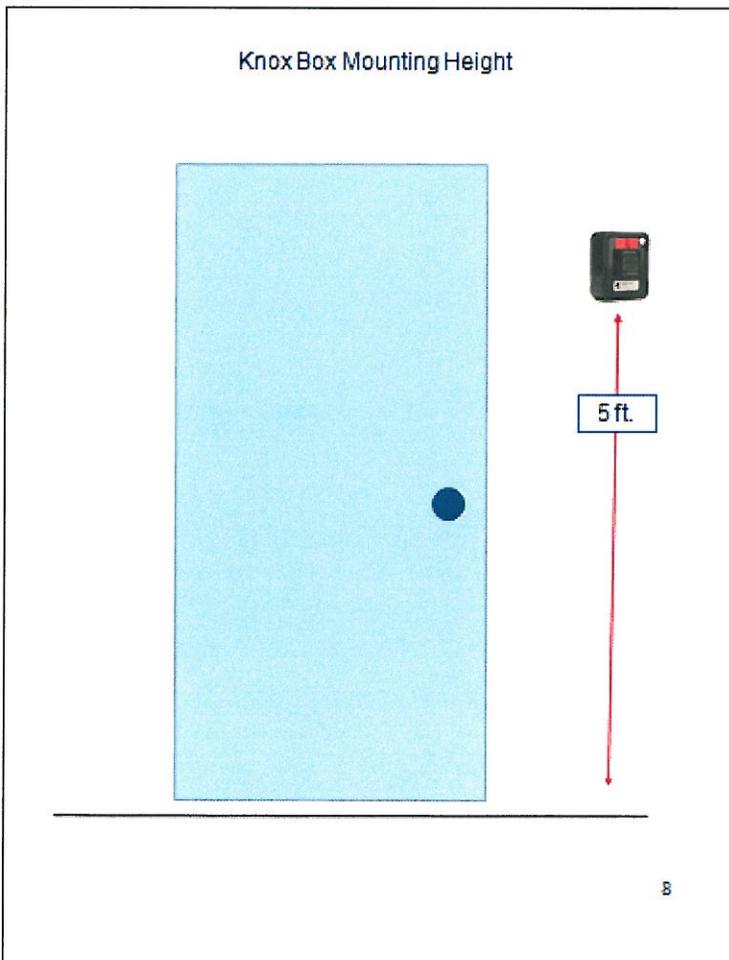
IFC 503.4 Obstruction of fire apparatus access roads. Fire apparatus access roads shall not be obstructed in any manner, including the parking of vehicles. The minimum widths and clearances established in Section 503.2.1 shall be maintained at all times.

IFC 505.1 Address numbers. New and existing buildings shall have approved address numbers, building numbers, building numbers or approved building identification placed in a position that is plainly legible and visible from the street side. The numbers shall contrast with their background. Numbers are to be Arabic numerals or alphabet letters a minimum of 4-inches high with a ½-inch stroke. 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.

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.

IFC 506.1 Key Boxes. Where access to or within a structure or an area is restricted, the fire department is authorized to require a key box. *The Unified Fire Authority only approves "Knox" brand lock boxes.*

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.



IFC 914.2.4 Fire Department Access to Equipment. Room or areas containing controls for air-conditioning systems, automatic fire-extinguishing systems or other detection, suppression or control elements shall be identified for use by the fire department.

Examples of Required Signs

RISER ROOM

**FIRE ALARM
CONTROL PANEL**

**WET STANDPIPE
SERVES EAST
STAIR ENCLOSURE**

**1 Inch high letters
Red on White Background
All Weather Construction**

Knox Model 3043 or 3050



IFC 903.3.6 Hose threads. Fire hose threads and fittings used in connection with automatic sprinkler systems shall be as prescribed by the fire code official.

IFC 903.3.7 Fire department connections. The location of fire department connections shall be approved by the fire code official.

IFC 912.3.1 Locking fire department connection caps. The fire code official is authorized to require locking caps on fire department connections for water-based fire protection systems where the responding fire department carries appropriate key wrenches for removal.

Water Main Size

General Summary:	Residential	8 inch minimum
	Light Commercial	10 – 12 inch minimum
	Industrial	12 – 14 inch minimum

The minimum size water main for any residential area shall be 8-inches in interior diameter. This minimum size will not accommodate all flow quantities required by code. Therefore, minimum water main size is to be determined by a licensed engineer who is qualified to calculate required fire flow based upon potential building design, size and location. In many cases larger looped water mains are required so developers will not be limited to smaller, more fire resistive structures. Individuals who purchase land and intend to build large buildings need to understand that the fire code absolutely requires increased fire flow, more fire hydrants, and larger water mains to accommodate firefighting needs where large buildings are built. This includes homes over 3,600 square feet in size.

IFC 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. The Unified Fire Authority will use IFC Appendix B for determining fire flow requirements for buildings. No more than a 50% reduction will be allowed for fire flow when a commercial building is protected throughout with a fire sprinkler system. A 25% reduction can be used for calculation of residential area seasonal pressure variations. Ref. IFC B105

When is a flow test required?

1. Any New Residential Dwelling Construction.
2. Any New Commercial Occupancy Construction.
3. Large additions need to be brought to the attention of the fire department so that a site visit will determine if a flow test is required.

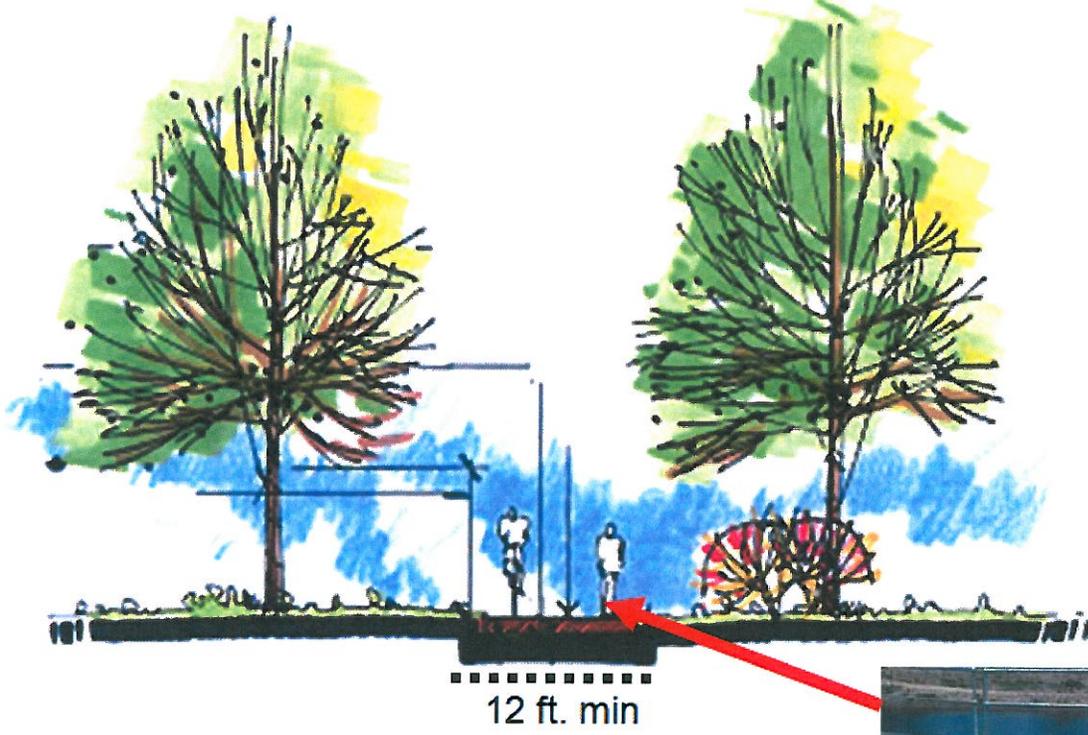
Actual determination of available or required fire flow must be calculated by an approved company. Companies that provide this service must submit to the fire department flow test data that complies with NFPA 291.

For questions pertaining to this document, contact the Unified Fire Authority Fire Prevention Bureau. 3380 S. 900 W. Salt Lake City Utah, 84119, 801-743-7230, Fax at 801-743-7121

TABLE B105.1
MINIMUM REQUIRED FIRE FLOW AND FLOW DURATION FOR BUILDINGS a

FIRE-FLOW CALCULATION AREA (square feet)					FIRE FLOW (gallons per minute) ^c	FLOW DURATION (hours)
Type IA and IB ^a	Type IIA and IIIA ^b	Type IV and V-A ^b	Type IIB and IIIB ^b	Type V-B ^b		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600	1,500	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800	1,750	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200	2,000	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700	2,250	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400	2,500	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300	2,750	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	4
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
203,701-225,200	114,601-128,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	128,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-51,500	6,000	
—	—	115,801-125,500	83,701-90,600	51,501-55,700	6,250	
—	—	125,501-135,500	90,601-97,900	55,701-60,200	6,500	
—	—	135,501-145,800	97,901-106,800	60,201-64,800	6,750	
—	—	145,801-156,700	106,801-113,200	64,801-69,600	7,000	
—	—	156,701-167,900	113,201-121,300	69,601-74,600	7,250	
—	—	167,901-179,400	121,301-129,600	74,601-79,800	7,500	
—	—	179,401-191,400	129,601-138,300	79,801-85,100	7,750	
—	—	191,401-Greater	138,301-Greater	85,101-Greater	8,000	

Trails, Walkways, Etc.



12 ft. min

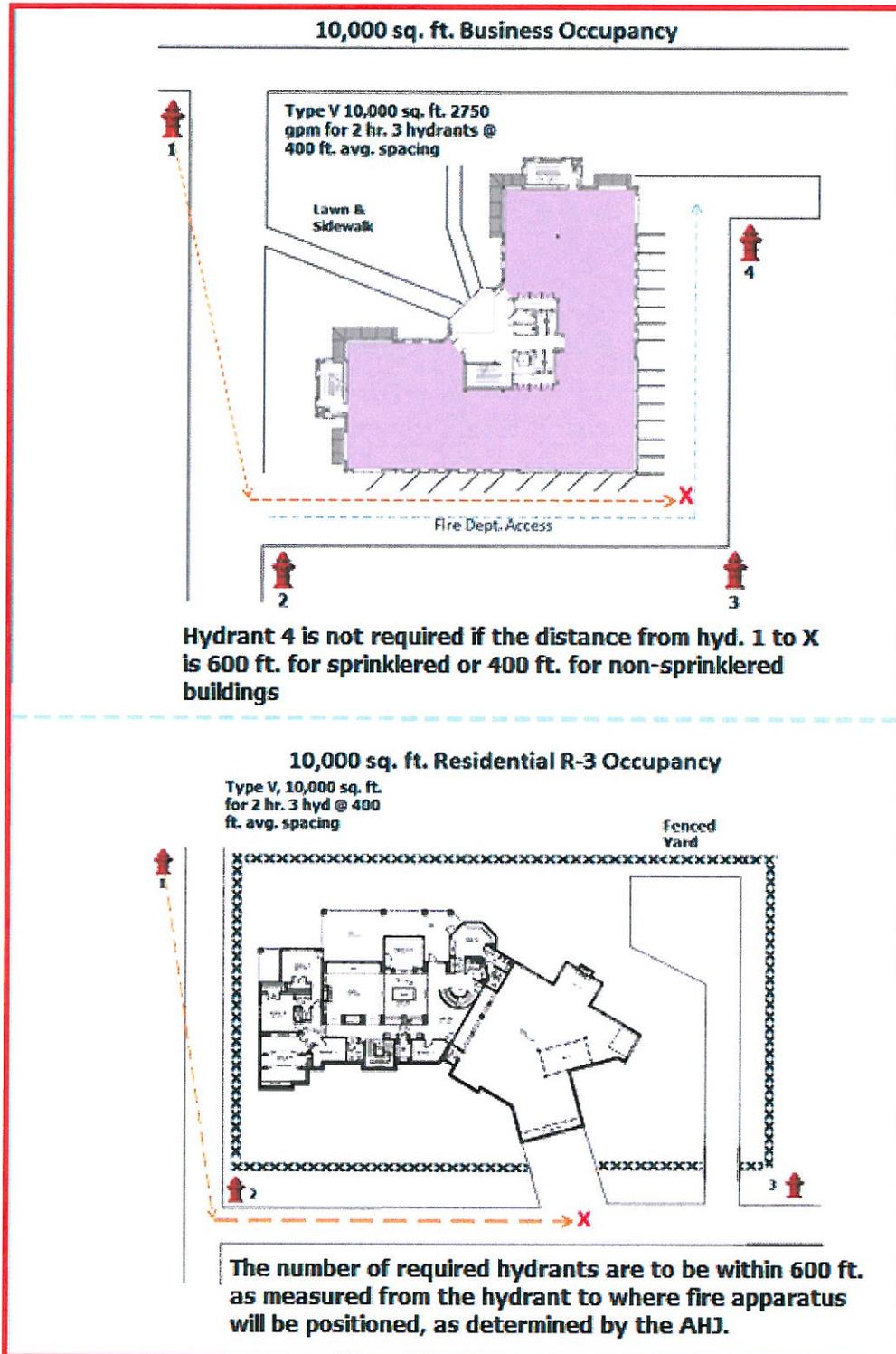


Removable lock,
"Knox" Model 3753

Center Bollard is removable for emergency vehicle access. 12 ft. minimum distance between bollards where the emergency vehicles access is required. All drivable surfaces to have minimum 75,000 lbs ASHTO rating.



Clarification on the Process to Determine Fire Hydrant Locations



Here is a typical reason why fire access needs to be a minimum of 20 ft. wide.



Unified Fire Authority KNOX BOX ORDER INFORMATION

1. WEB SITE: www.knoxbox.com
2. Click on ONLINE PURCHASE.
3. Enter zip code (84119).
4. Choose **Unified Fire Authority** as the fire department listed
5. On drop down menu select the Item that you want to purchase, i.e. Knox Box 3200 Series, Key Switches etc.
6. Select Buy Now!

When buying the 3200 / 1650 Series Knox Box
“Door Type” select “Hinged Door”
“Mounting Type” is optional
“Color” is optional
“Tamper Switch” is optional.



3200 Series Surface Mount
Mount Hinged Door



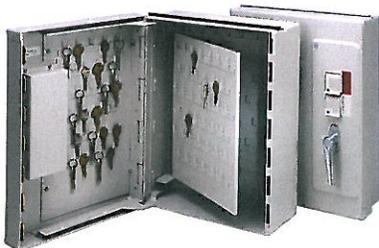
3200 Series Recessed Mount
Hinged Door



1650 Series Surface
Hinged Door



*1650 Knox
Residential



1300 Series Cabinet
Plug Model 3043
or 3042



3500 Series Key Switch



3753 Padlock



FDC

Mount Knox box no more than 5 feet high near the main front door, and opposite the outside swing of the riser room door.

*KNOX model 1650 residential type lock boxes can be used for individual strip mall type occupancies or when approved by the Unified Fire Authority Area Fire Inspector call 801-743-7230 for approval.