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Fire Apparatus Access and Fire Hydrant Worksheet

The information contained in this worksheet is provided solely for the convenience of determining compliance of the rules and regulations as it relates to fire apparatus access roads and fire hydrants which are specifically detailed within the NC Fire Code and Town of Hillsborough Code of Ordinances Chapter 12.

PROJECT INFORMATION			DESIGN FIRM INFORMATION		
Project Name			Design Firm Name		
Contact Name			Contact Name		
Project Address			Design Firm Address		
City	State	Zip Code	City	State	Zip Code
Telephone			Telephone		

Section 1	Fire Apparatus Access Roads	NCFC 503.1.1	Yes	No	N/A
	Is the building completely protected by an NFPA 13 or 13R automatic fire sprinkler system?				
	If non-sprinklered , Do fire lanes extend to within 150-feet of all portions of the exterior walls?				
	If sprinklered, fire lanes are within 200-feet of all portions of the exterior walls?				

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. The fire apparatus access road shall comply with the requirements of this section and shall extend to within 150 feet (45 720 mm) of all portions of the facility and all portions of the exterior walls of the first story of the building as measured by an approved route around the exterior of the building or facility.

Exceptions:

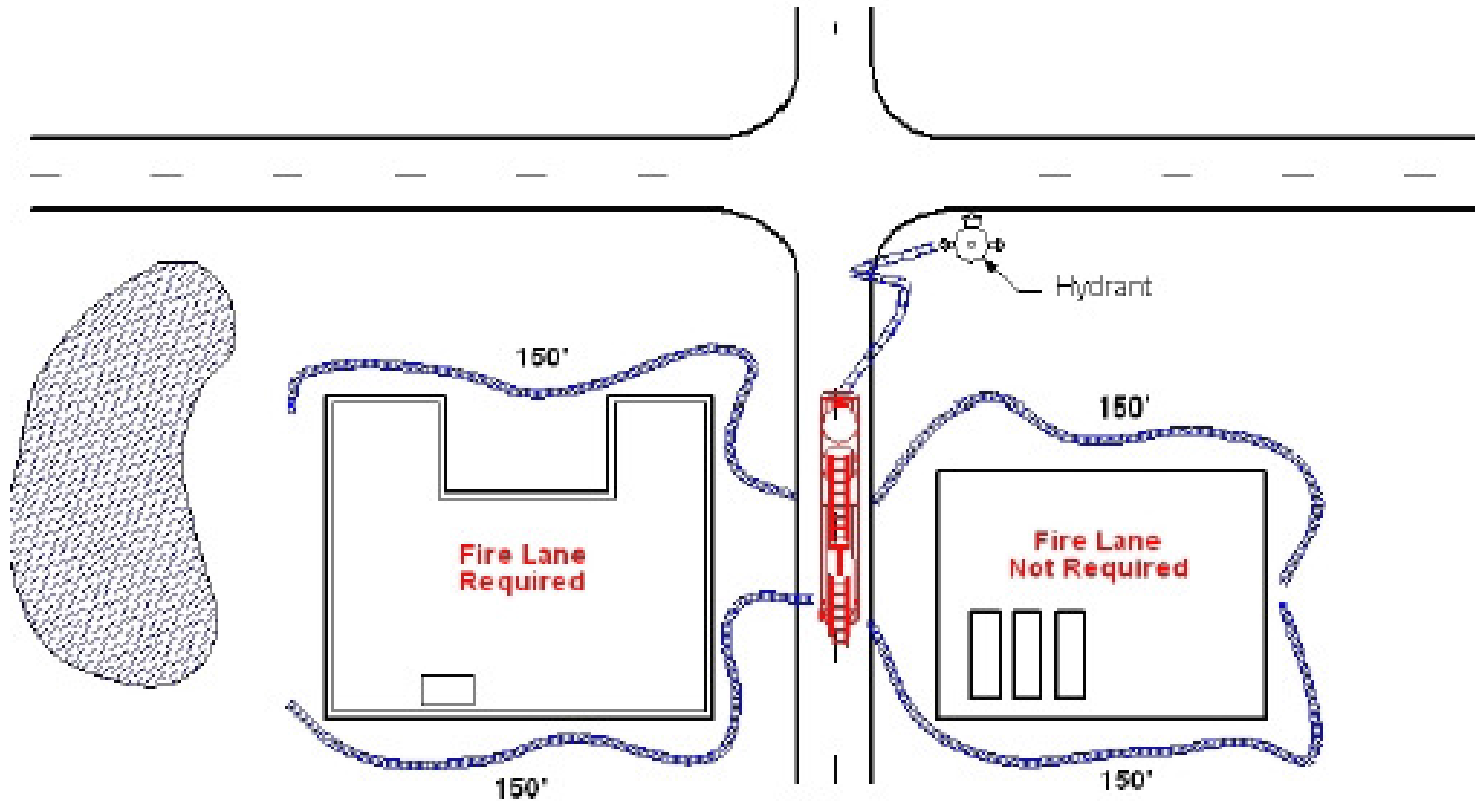
1. The distance is permitted to be 200 feet (91 440 mm) where the building is equipped throughout with an approved automatic sprinkler system installed in accordance with sec 903.3.1.1 or sec 903.3.1.2, when approved by the code enforcement official.

Fire department access roads are to extend to within 150 feet of **ALL PORTIONS** of every structure's exterior first floor constructed. The amount of pre-connected hose that the fire department carries on each apparatus is 200-ft. During a fire; this pre-connected hose is carried by the firefighters 150 feet around the structure.

Keep in mind that this measurement is how the hose will lay and not as how the crow flies. The 150-ft distance must be measured from an approved fire department apparatus access.

150 ft. Rule Example

Below is a representative example of a method to determine if a fire lane is required based upon the 150 ft. rule determination methodology only.



		Section 2 Aerial Fire Apparatus Access Road		
		Yes	No	N/A
Is any part of the building greater than 30-feet above the lowest level of fire apparatus access?				
If yes	a) Is the aerial apparatus fire lane parallel to one entire side of the building?			
	b) Is the near edge of the aerial apparatus fire lane between 15' and 30' from the building?			
	c) Are there any overhead power or utility lines located across the aerial apparatus fire lane?			
	d) Does the aerial apparatus fire lane have a minimum unobstructed width of 26-feet?			

NCFC D105.1 Where required. Buildings or portions of buildings or facilities exceeding 30 feet (9144 mm) in height above the lowest level of fire department vehicle access shall be provided with approved fire apparatus access roads capable of accommodating fire department aerial apparatus. Overhead utility and power lines shall not be located within the aerial fire apparatus access roadway.

NCFC D105.2 Width. Fire apparatus access roads shall have a minimum unobstructed width of 26 feet (7925 mm) in the immediate vicinity of any building or portion of building more than 30 feet (9144 mm) in height.

NCFC D105.3 Proximity to building. At least one of the required access routes meeting this condition shall be located within a minimum of 15 feet (4572 mm) and a maximum of 30 feet (9144 mm) from the building, and shall be positioned parallel to one entire side of the building.

Section 3	Specifications	(NFC - Appendix D102)	Yes	No	N/A
	Is the fire lane constructed of concrete or asphalt, designed to support a minimum load of 75,000 lbs?				
If yes	a)	Is the fire lane a minimum unobstructed width of at least 20-feet?			
	b)	Is the fire lane unobstructed with a vertical clearance of at least 13½-feet?			
	c)	Is the minimum inside turning radius of the fire lane at least 30-feet?			
	d)	Is the grade of the fire lane not more than a slope of 10%?			
	e)	Is the fire lane posted as fire lane?			
	a.	Is a detail of the signage included on the site plan?			
	f)	Is a roll-able curb used as part of the fire lane?			
	a.	Is a detail of the curb included on the site plan?			
	g)	Is part of a sidewalk used as part of the required fire lane?			
	a.	Is the sidewalk constructed to withstand 75,000-lbs?			

NFC D102.1 Access and loading. Facilities, buildings or portions of buildings hereafter constructed shall be accessible to fire department apparatus by way of an approved fire apparatus access road with an asphalt, concrete or other approved driving surface capable of supporting the imposed load of fire apparatus weighing at least 75,000 pounds (34 050 kg).

NFC 503.2.1 Dimensions. Fire apparatus access roads shall have an unobstructed width of not less than 20 feet (6096 mm), except for approved security gates in accordance with §F503.6, and an unobstructed vertical clearance of not less than 13 feet 6 inches (4115 mm). Fire apparatus access roads shall also meet the width requirements of D103.1 and D105 of Appendix D.

NFC 503.2.4 Turning radius. The required turning radius of a fire apparatus access road shall be determined by the code enforcement official.

NFC 503.2.7 Grade. The grade of the fire apparatus access road shall be within the limits established by the code enforcement official or by §FD103.2, based on the fire department's apparatus.

NFC 503.3 Marking. Where required by the code enforcement official, approved signs or other approved notices shall be provided for fire apparatus access roads to identify such roads or prohibit the obstruction thereof. Signs or notices shall be maintained in a clean and legible condition at all times and be replaced or repaired when necessary to provide adequate visibility



The minimum width for fire lanes is 20 feet, unless otherwise approved. The theory behind why the 20 foot dimension is based on the width of fire apparatus and their operating space requirements. Typically, fire apparatus are between 9 and 11 feet in width. Therefore a 20 foot fire lane would generally allow apparatus to pass each other if needed. Fire apparatus that utilize aerial devices require apparatus stabilization when the aerial device is deployed. The apparatus stabilization comes in the form of outriggers that extend out from the apparatus which provide a wider overall base in which to operate the aerial device. These outriggers, when fully extended, range between 16 and 19 feet. Because of these fire apparatus features, the minimum width of fire lanes is 20 feet.

This vertical clearance is the standard used for highway bridges and underpasses. This clearance pertains to anything and everything that overhangs the fire apparatus access road such as trees, signs, wires, etc.

Section 4		Secured gates and barricades	Yes	No	N/A
		Is the fire lane obstructed by security gates or barricades?			
If yes	a)	Is the gate a minimum of 20-foot clear opening?			
	b)	Is an approved means of emergency operations installed, knox Box, padlock or key switch?			

Gates shall not be installed across fire department access roads unless the following conditions can be met:

Exception: Access roads less than 150' in length serving one single family residence.

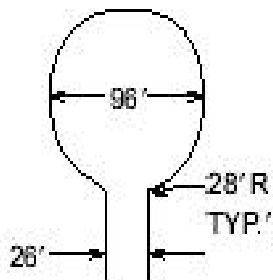
1. A permit is required to install gated access to property or an electronically controlled access gate(s) which obstructs a fire department access road.
2. Plans and specification for access gates shall be submitted to the Office of the Fire Marshal for review and approval prior to construction.
3. The electronically controlled gate shall have a minimum clear width of 20 feet when fully open and a minimum vertical clearance of 13 feet 6 inches.
4. The gate shall be set back a minimum of 30 feet from the access roadway edge of pavement, or from the back of sidewalk where a sidewalk exists.
5. Manually locked gates shall use chains or locks that can be cut with normal bolt cutters or have a Knox Box at an approved location near the gate with the key.
6. Electronically controlled gates shall be provided with an approved Knox Key switch or an approved vehicle detector-receiver system. When operated by the Fire Department the gate shall remain in the full open position until the Fire Department has left the property.

Exception: A Knox switch and/or an approved vehicle detector-receiver system is not required for gates that are staffed 24 hours a day, 7 days a week.

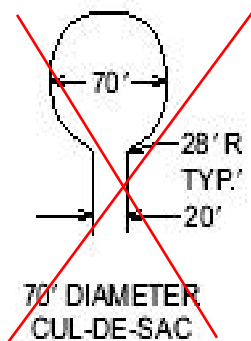
7. Provide a backup power supply to operate the electronically operated gate in the event of a power outage. Provide information on the number of times the gate can be operated with the backup power supply.
8. On electronic gates an alternative to the backup power supply is to have the gate fail in the full open position when the normal power is off. The gate shall remain in the full open position until the normal power is restored.
9. On electronic gates a means shall be provide to remove the controlling arm/mechanism for the gate without the use of any tools, in the event the backup up power supply is not operating.
10. If a fence is located on each side of the gate a man door shall be provide at an approved location with a Knox Key for access to the man door.

11. Electronically controlled gates shall be maintained operational at all times. When the gate, locks or other parts are out of service it shall be secured in the full open position until repaired. Repairs shall be in accordance with original specifications.
12. A contact person shall be listed on each gate and shall include the person, company and phone number.
13. The use of directional-limiting devices (tire spikes) shall be prohibited.
14. An operational test shall be requested by the installer and witnessed by the fire code official prior to placing the system in service.

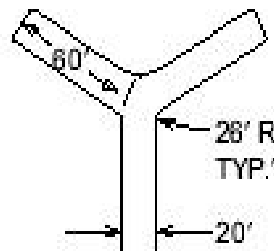
Section 5		Dead ends (D103.4)	Yes	No	N/A
		Is the Fire lane dead-ended with a length greater than 150-feet?			
If yes	Is the area for turning around fire apparatus provided by:				
	a) A cul-de-sac with a minimum inside diameter of 96-feet?				
	b) A 45-degree wye with a minimum length of 60-feet per side?				
	c) A 90-degree tee with a minimum length of 60-feet per side?				



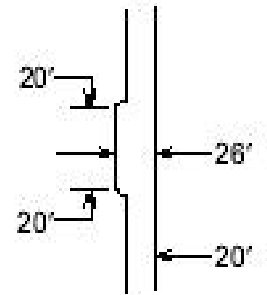
96' DIAMETER
CUL-DE-SAC



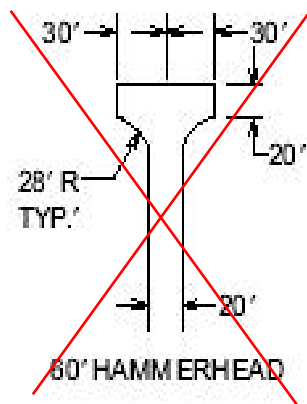
70' DIAMETER
CUL-DE-SAC



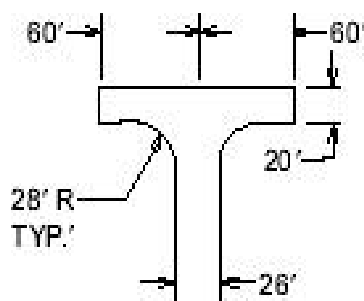
ACCEPTABLE ALTERNATIVE
TO 120' HAMMERHEAD



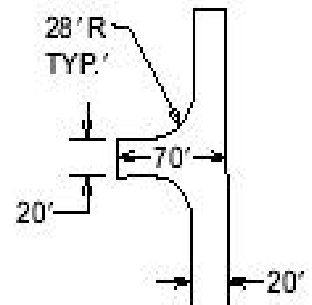
MINIMUM CLEARANCE
AROUND A FIRE
HYDRANT



60' HAMMERHEAD



120' HAMMERHEAD



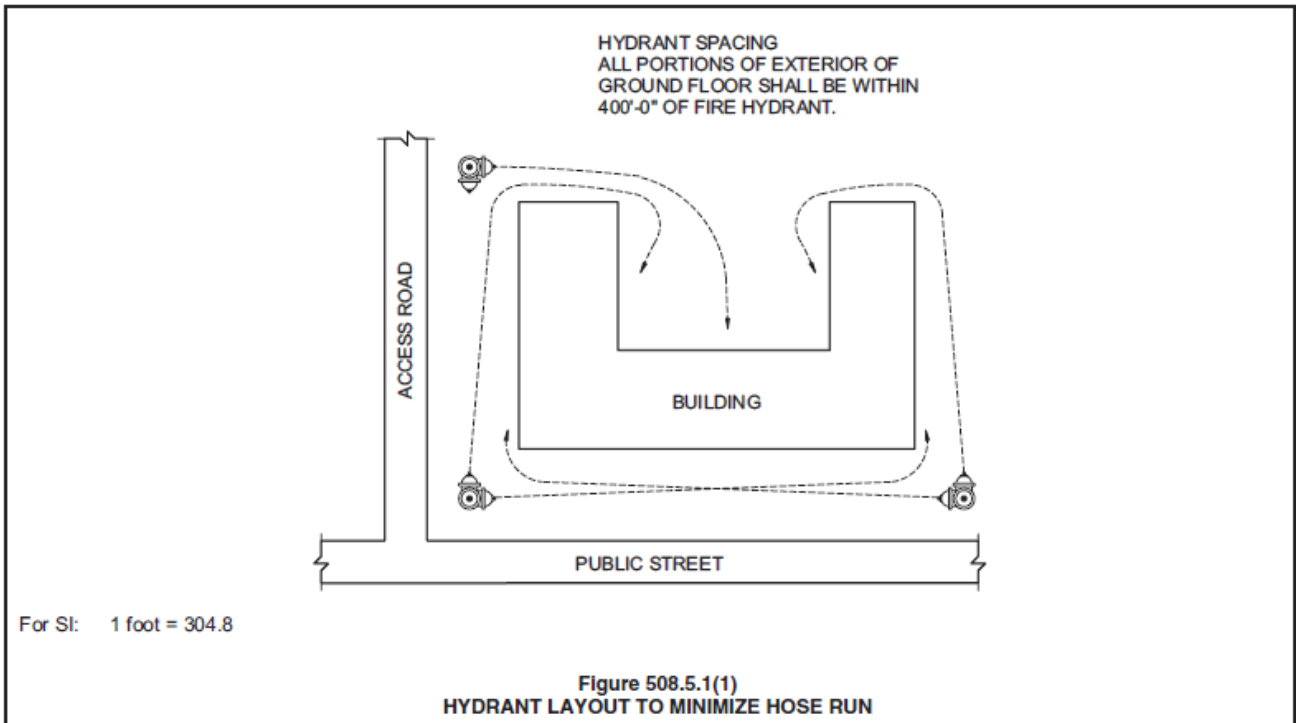
ACCEPTABLE ALTERNATIVE
TO 120' HAMMERHEAD

Section 6		High Piled Combustible Storage	Yes	No	N/A
		Is any portion of the building to be used for high-piled storage in accordance with NCFC Chapter 23?			

If yes	See NCFC 2306.6 for further requirements			
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Section 7	Fire hydrant systems (NCFC 508.5)	Yes	No	N/A
Is the newly constructed building more than 400 feet (122 m) from a hydrant on a fire apparatus access road or public street, as measured by an approved route around the exterior of the facility or building?				
If yes	For buildings equipped throughout with an approved automatic sprinkler system installed in accordance with sec 903.3.1.1 or sec 903.3.1.2, the distance requirement shall be increased to 600 feet (183 m).			
	Posts, fences, vehicles, growth, trash, storage and other materials or objects shall not be placed or kept near fire hydrants, fire department connections or fire protection system control valves in a manner that would prevent such equipment or fire hydrants from being immediately discernible. The fire department shall not be deterred or hindered from gaining immediate access to fire protection equipment or fire hydrants.			
	Are there no obstructions, including but not limited to: power poles, trees, bushes, fences, posts located, or grade changes exceeding 1½-feet, within 5-feet of a fire hydrant?			

Note: Hydrants shall be installed and in-service prior to combustible construction on the project site.



The intent of this section is that not more than 400 feet (122 m) of hose will have to be layed out to reach all portions of the exterior grade level of the building. Each hydrant must be accessible to fire apparatus and the 400-foot (122 m) distance should be measured from the hydrant(s) to all portions of the exterior at ground level.