

NFPA[®]

1141

**Standard for Fire Protection
Infrastructure for Land
Development in Wildland, Rural,
and Suburban Areas**

2017



- (2) The material is reported as passing ASTM E136, *Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C.*
- (3) The material is reported as complying with the pass/fail criteria of ASTM E136 when tested in accordance with the test method and procedure in ASTM E2652, *Standard Test Method for Behavior of Materials in a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750 Degrees C.*

[5000: 7.1.4.1.1]

Chapter 5 Means of Access

5.1 General.

5.1.1 This section shall apply to all means of access, publicly or privately owned, whether or not they are designated as public thoroughfares.

5.1.2 Means of access shall be provided to all buildings more than 400 ft² (37 m²) in ground floor area and to public occupancies with structural components.

5.1.3 The AHJ shall have the authority to require a means of unlocking any security feature that is installed.

5.1.3.1 Any gates shall not be located closer than 30 ft (9.144 m) from an intersection and shall open in the direction of emergency vehicle travel unless other provisions are made for safe personnel operation.

5.1.3.2 The clear opening through gates shall have a usable width at least 2 ft (0.6 m) wider than the means of access it controls.

5.1.4 Number of Means of Access.

5.1.4.1* A land development shall have one or more means of access in accordance with Table 5.1.4.1(a), Table 5.1.4.1(b), or 5.1.4.2, whichever produces the greatest number.

5.1.4.2 Where residential areas are mixed with nonresidential areas, the minimum number of access routes shall be determined by calculating five parking spaces for each dwelling unit, adding that number to the parking spaces count for the nonresidential area, and using Table 5.1.4.1(b).

5.1.4.3 Where multiple means of access are required, one of the means of access shall be permitted to be restricted for emergency use only, when approved by the AHJ.

Table 5.1.4.1(a) Required Number of Access Routes for Residential Areas

Number of Households	Number of Access Routes
0-100	1
101-600	2
>600	3

Table 5.1.4.1(b) Required Number of Access Routes for Nonresidential Areas

Number of Parking Spaces	Number of Access Routes
0-1250	1
1251-3000	2
>3000	3

5.1.4.4 Where multiple means of access are required, they shall be located as remotely from each other as practical and acceptable to the AHJ.

5.2 Roadways. Roadways shall be constructed and maintained in accordance with this section.

5.2.1* The legal right-of-way for a roadway shall accommodate the width necessary for the construction, drainage, erosion control, and maintenance of the roadway, and provisions for utilities and sidewalks.

5.2.2 Roadways shall be constructed of a hard, all-weather surface designed to support all legal loads of the jurisdiction.

5.2.3 Roadways shall have a minimum clear width of 12 ft (3.7 m) for each lane of travel, excluding shoulders and parking.

5.2.3.1 Curves shall not reduce the width of the roadway.

5.2.3.2 Provisions shall be made for drainage, snowbanks, parking, utilities, and the like such that they do not impinge on the minimum clear width.

5.2.4 Where parking is permitted, such space shall be provided in accordance with Section 5.4.

5.2.5 Any roadway intersecting with another shall be sloped to prevent the accumulation of water and ice on either roadway.

5.2.6 At least 13 ft 6 in. (4.2 m) nominal vertical clearance shall be provided and maintained over the full width of the roadway.

5.2.7 Turns in roadways shall be constructed with a minimum radius of 60 ft (18.2 m) to the outside of the turn.

5.2.8 Median left-turn lanes and traffic signals shall be provided at intersections where necessary to prevent traffic from impeding fire department response time.

5.2.9 Where required by the AHJ, any traffic signal system shall have an automatic means for fire apparatus to control the signals to maintain an unimpeded right-of-way.

5.2.9.1 Sight distance shall be incorporated into the design of intersections.

5.2.10* Bridges and culverts shall be designed to accommodate a minimum of 100-year flood elevations and flows in accordance with accepted engineering practices.

5.2.11 Vehicle load limits shall be posted at both entrances to bridges where required by the AHJ.

5.2.12 Easements shall be obtained to permit vegetation clearance alongside roads to minimize the likelihood of evacuation routes being blocked during wildfire or other natural disasters.

5.2.13* Roadways shall not be designed and constructed to include speed bumps or speed humps.

5.2.14 Alternative traffic calming devices such as chicanes and roundabouts shall be acceptable with approval by the AHJ.

5.2.15 Roadway design shall incorporate provisions for emergency pull-offs, spaced according to the AHJ.

5.2.16 Grades.

5.2.16.1 Grades shall not be more than 10 percent, except as permitted by this section.

5.2.16.2* Grades steeper than 10 percent shall be permitted by the AHJ where mitigation measures can be agreed upon by the fire department and the road engineering department, taking into consideration climate, traffic load, environmental conditions, the number of turns that would affect traffic flow, and the ability of fire apparatus to operate on steeper grades.

5.2.16.3 The angle of approach and the angle of departure shall not exceed 8 degrees at any point on the roadway or its intersection with another roadway or fire lane.

5.2.16.4 Where local conditions do not allow the maximum angles of approach and departure be limited to 8 degrees, the AHJ shall permit greater angles where local emergency apparatus can accommodate such angles.

5.2.16.5 Where grades are less than 0.5 percent, the road shall be crowned in the center to prevent pooling of water in a traveled way.

5.2.16.6 The design of grade crossings at railroad tracks shall be done by a professional engineer with expertise in railroad grade crossings.

5.2.17 Dead Ends.

5.2.17.1 Every dead-end roadway more than 300 ft (91 m) in length shall be provided at the closed end with a turnaround having no less than a 120 ft (36.6 m) outside diameter of the traveled way.

5.2.17.2* The length of any cul-de-sac shall not exceed the fire-fighting capability of the fire department.

5.2.17.3* A cul-de-sac exceeding 1200 ft (366 m) in length shall be provided with approved intermediate turnarounds at a maximum of 1200 ft (366 m) intervals.

5.2.18 Signage.

5.2.18.1 Addresses shall be assigned in a logical, consistent manner based on the local addressing system. Street names shall be phonetically unique.

5.2.18.2 Sign assemblies with the name of each road shall be constructed of noncombustible material and installed at each intersection.

5.2.18.3 These signs shall be installed a minimum of 7 ft (2.1 m) above the traveled way.

5.2.18.4 The letters on the signs shall be no less than 4 in. (100 mm) in height, with at least a 0.5 in. (12.7 mm) stroke, reflective and of a contrasting color to the background of the sign.

5.2.18.5 Where required by the AHJ, signs shall also include references to address numbers pertinent for that section of the road.

5.2.18.6 Where required by the AHJ, signs shall be erected at intersections indicating directions and distance to the nearest water supply.

5.2.18.7 Where the location of the nearest water supply is not obvious, signs or other directional symbols shall be erected indicating directions and distance to the nearest water supply.

5.2.18.8 The beginning of every dead-end roadway and developments with only single access shall have signage indicating that there is not a second outlet.

5.3* Fire Lanes.

5.3.1 Approval.

5.3.1.1 Fire lane plans shall be reviewed and approved by the AHJ and the fire department responsible for the protection of the property.

5.3.1.2 Changes to access points, gates, or fire lane layout shall be pre-approved by the AHJ.

5.3.2 Driveways, parking lot lanes, delivery lanes, and private roadways shall be permitted to be used as fire lanes if they meet the requirements of this section.

5.3.3 Fire lanes shall be constructed of a hard, all-weather surface designed to support any vehicle within the legal load limits of the jurisdiction.

5.3.4 The grade from a fire lane to the exterior wall of the grade level floor of a building shall not exceed 10 percent.

5.3.5 Fire lanes connecting to roadways shall be provided with curb cuts extending at least 2 ft (0.6 m) beyond each edge of the fire lane.

5.3.6 Fire lanes intended for one-way travel shall provide a minimum of 16 ft (5 m) in width of traveled way. Fire lanes providing two-way travel shall be a minimum of 24 ft (7.3 m) in width of traveled way.

5.3.6.1 The AHJ shall be permitted to allow a reduction in fire lane width where the sole purpose of the fire lane is for emergency access and operations.

5.3.6.2 Fire lane widths shall not include shoulders, sidewalks, or drainage.

5.3.7 Extra width shall be provided where the fire department determines such width is necessary to position apparatus for operations during an incident.

5.3.8 Turns in fire lanes shall be constructed to provide sufficient width to accommodate the largest piece of fire apparatus available to be operated on the fire lane, but in no case shall the radius to the outside curb line be less than 50 ft (15.2 m).

5.3.9 All grades in fire lanes shall meet the requirements of 5.2.5.

5.3.10 At least 13 ft 6 in. (4.2 m) nominal vertical clearance shall be provided and maintained over the full width of a fire lane.

5.3.11 The angle of approach and the angle of departure shall not exceed 8 degrees at any point on the fire lane or its intersection with other roads or fire lanes.

5.3.12 When a bridge is required to be used as part of a fire department access road, it shall be constructed and maintained in accordance with nationally recognized standards. [1:18.2.3.4.5.1]

5.3.12.1 The bridge shall be designed for a live load sufficient to carry the imposed loads of fire apparatus. [1:18.2.3.4.5.2]

5.3.12.2 Vehicle load limits shall be posted at both entrances to bridges where required by the AHJ. [1:18.2.3.4.5.3]

5.3.13 Any bridge constructed as part of a fire lane shall provide width of no less than that required for the fire lane.

5.3.14 Dead-end fire lanes that exceed 300 ft (91 m) in length shall be provided with a minimum 120 ft (36.6 m) diameter turnaround at the closed end of the fire lane.

5.3.15 The clear opening through gates in fire lanes shall be at least 2 ft (0.6 m) wider than the traveled way.

5.3.16 All gates at the entrance to fire lanes shall be located a minimum of 30 ft (9.144 m) from the roadway and shall open away from the roadway, unless other provisions are made for safe personnel operation.

5.3.16.1 The AHJ shall have the authority to require a means of unlocking any security feature that is installed.

5.3.16.2 If needed, fire department personnel shall have ready access to any manual releases that could be required if there is an interruption of utility power.

5.3.16.3 Means shall be provided to override normal operation and allow any gate to remain open until manually closed.

5.3.17 An acceptable plan for wintertime maintenance of access through any gates and along any fire lane shall be submitted to the fire department responsible for the protection of the property.

5.3.18 Approved "No Parking — Fire Lane" signs shall be posted in accordance with the instructions of the fire department having responsibility and a method of enforcing such provisions shall be provided by the local jurisdiction.

5.4 Parking Lots.

5.4.1* The minimum lengths of parking lot stalls shall be measured end to end as shown in Figure 5.4.1, and the minimum stall length and aisle widths shall be as shown in Table 5.4.1.

5.4.2 Parking lot aisles adjacent to any building shall provide a travel lane with a minimum 24 ft (7.3 m) clear width.

5.4.3 The minimum turning radius for parking lot aisles necessary for fire department apparatus access shall be determined by the fire department having responsibility.

Chapter 6 Building Access and Separation

6.1 General. At least one approved means of fire apparatus access shall be provided to each building in accordance with this section.

6.1.1* Approved fire apparatus access shall be provided to within 150 ft (45 m) of any point of the exterior wall of each building.

6.1.1.1 The requirements of 6.1.1 shall be permitted to be extended to 300 ft (91 m) for any building protected by an automatic sprinkler system installed and maintained according to NFPA 13 or NFPA 13R, whichever is applicable.

6.1.2 Approved fire apparatus access shall be provided to within 50 ft (15.2 m) of at least one exterior door providing access to the interior of the building.

6.1.2.1 The requirement of 6.1.2 shall not apply to one- and two-family dwellings.

Table 5.4.1 Minimum Parking Lot Stall Dimensions and Minimum Aisle Lengths

Parking Angle	Minimum Stall Length		Minimum Aisle Width, One-Way Traffic Flow		Minimum Aisle Width, Two-Way Traffic Flow	
	ft	m	ft	m	ft	m
45 degrees	27.5	8.4	16	4.9	24	7.3
60 degrees	23.7	7.2	16	4.9	24	7.3
75 degrees	20.9	6.4	23	7.0	24	7.3
90 degrees	18.5	5.6	26	7.9	26	7.9

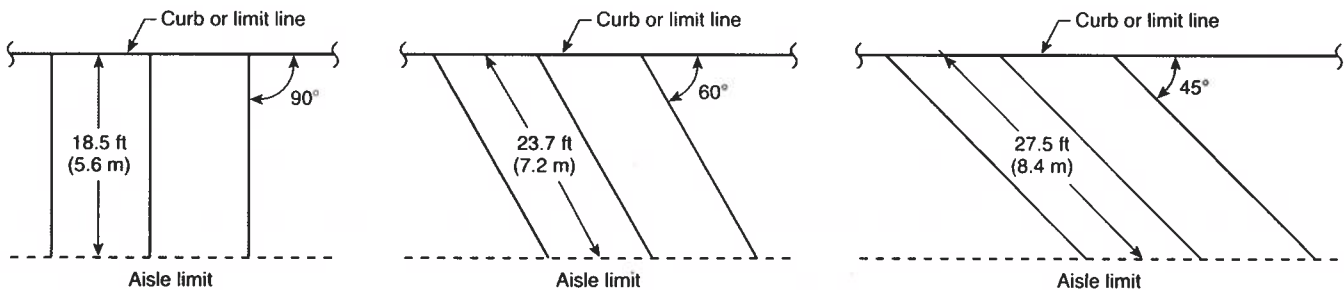


FIGURE 5.4.1 Measurements for Parking Stall Length.