Site Plans

Fire Code Requirements
Outline

- Before you start...
  - Critical building information drives requirements
- Access Requirements
  - Access, aerial access, road design, remoteness, fire lanes, residential development
- Water Supply Requirements
  - Hydrant placement, fire flow, fire department connections
- General Requirements
  - Access during construction, clearance to landscaping
- Performance Alternatives
  - Types of construction, level of sprinkler protection
- Odds & Ends
  - Address identification, Lock box, undeveloped areas
Before you start...

- Critical Building Information
  - Occupancy Type (or proposed occupancy type)
  - Construction Type
  - Sprinklers Provided?
    - NFPA 13
    - NFPA 13R
    - NFPA 13D (one and two family dwellings)
  - Total Building Square Footage
  - Total Building Height
Access Requirements
Fire Department Access

- 150 feet within ALL portions of the building
  - Measured as the hose lays on the ground
- Can be extended to 250’ if the building is fully sprinklered
- Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be of a continuous hard surface such as concrete, asphalt, rock, or other continuous hard surface material so as to provide all-weather maintenance and driving capabilities.
  - Grass pavers or similar type products that are not readily distinguishable as a road surface shall not be used.
Area of building that is not within 150 feet of a fire access road. A fire access road is required to be a minimum of 20 feet wide.
Fire Department Access Roads

- City of Des Moines Fire Prevention Code Section 46 - 68.
  - Fire apparatus access roads shall have a minimum unobstructed width of 20 feet
  - 26 feet where a hydrant is located on the access road.
Delete Code Section: IFC 503.2.1

Replace with the following language:

503.2.1 Dimensions. Fire apparatus access roads shall have a minimum unobstructed width of not less than 20 feet (6096 mm), exclusive of shoulders, except for approved security gates in accordance with Section 503.6, and an unobstructed vertical clearance of not less than 14 feet (4268 mm).
Fire Department Access Roads - Loading

- 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).
Fire Department Access Roads - Grade and Angles

- 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.
  - D103.2 Grade. Fire apparatus access roads shall not exceed 10 percent in grade.
- 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.
Access Road vs. Fire Lane

- Not every road is a fire lane, nor does it have to be
- Not every fire lane needs to be marked:
  - D103.6.1 Roads 20 to 26 feet in width. Fire lane signs as specified in Section D103.6 shall be posted on both sides of fire apparatus access roads that are 20 to 26 feet wide.
  - D103.6.2 Roads more than 26 feet in width. Fire lane signs as specified in Section D103.6 shall be posted on one side of fire apparatus access roads more than 26 feet wide and less than 32 feet wide.
Fire & Emergency Vehicle Lanes

Add Code Section: IFC 511

Language:

Section 511 Fire and Emergency Vehicle Lanes.

Section 511.1 General. Fire and emergency vehicle lanes shall be provided and maintained in accordance with section 511.1 through 511.6, and referred to as fire lanes in this ordinance.

Section 511.2 Purpose. The requirement that Fire Lanes be established in certain parking areas and the enforcement of restrictions on parking in such Fire Lanes established in this Chapter are designed to ensure adequate access to commercial, office, multi-family, and other high density use facilities by fire-fighting and other emergency vehicles.

Section 511.3 Designation. The Fire Code Official may designate fire lanes on private and public property as deemed necessary for the protection of life and property.
Fire & Emergency Vehicle Lanes

Section 511.4 Obstruction. No person shall park or place a vehicle or other obstruction in a designated fire lane that would prevent such fire lane from being immediately accessible to emergency vehicles, or deter or hinder emergency vehicles from gaining immediate access to the fire lane. A written request to the jurisdictional Fire Code Official for temporary obstruction of a fire lane shall be submitted for approval.

Section 511.5 Signs and markings. Wherever a fire lane has been designated, the Code Official shall cause appropriate signs and markings to be placed identifying such fire lanes. Signs or markings shall be maintained in a clean and legible condition at all times and shall be replaced or repaired when necessary to provide adequate visibility. Fire lanes may be established or relocated at the time of plan review, pre-construction site inspection, and/or post construction site inspection, as well as any time during the life of the occupancy as needed to provide and maintain emergency vehicle access. All designated fire lanes shall be clearly marked in the following manner:
Fire & Emergency Vehicle Lanes (signs and markings)

1. Vertical curbs shall be painted red on the top and side, extending the length of the designated fire lane. Rolled curbs or surfaces without curbs shall have a red (6) inch wide stripe painted the length of the designated fire lane. One of the following identification lettering methods shall be utilized:

   A. The words “NO PARKING – FIRE LANE (Except for Emergency Vehicles)” shall be stenciled with three (3) inch white letters and a minimum three – quarter (¾) inch stroke on the face of the curbing, or in the absence of vertical curbing, on the red stripe, and spaced at fifty (50) foot intervals or portions thereof, or

   B. The pavement adjacent to the painted curbs shall be marked with minimum eighteen (18) inch in height block lettering with a minimum three (3) inch brush stroke reading: “NO PARKING - FIRE LANE.” Lettering shall be red and spaced at fifty (50) foot intervals or portions thereof.
Fire & Emergency Vehicle Lanes
(signs and markings)

2. Signage identifying fire lanes shall conform to the following: Fire lane signs shall be 18 inches tall x 12 inches wide with red letters on a white reflective background to read “Fire Lane No Parking Except For Emergency Vehicles” or similar verbiage as approved by the code official. Fire lane signs shall be placed 2 - 4 feet from the edge of the Fire Lane. The bottom of fire lane signs shall be between five (5) and seven (7) feet from the ground. Intermediate fire lane signs shall be set every one hundred (100) feet in a continuous fire lane. The BEGINS sign shall mark the beginning of a fire lane and shall be mounted below the first fire lane sign. The ENDS sign shall mark the ending of a fire lane and shall be mounted below the last fire lane sign. The BEGINS and ENDS signage may be omitted by the Code Official due to the location of the fire lane. Signs may be placed on a building when approved by the Fire Code Official.
Fire & Emergency Vehicle Lanes (example)
Fire Access Roads - Dead Ends

- **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.

<table>
<thead>
<tr>
<th>LENGTH (feet)</th>
<th>WIDTH (feet)</th>
<th>TURNAROUNDS REQUIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-150</td>
<td>20</td>
<td>None required</td>
</tr>
<tr>
<td>151-500</td>
<td>20</td>
<td>120-foot Hammerhead, 60-foot “Y” or 96-foot diameter cul-de-sac in accordance with Figure D103.1</td>
</tr>
<tr>
<td>501-750</td>
<td>26</td>
<td>120-foot Hammerhead, 60-foot “Y” or 96-foot diameter cul-de-sac in accordance with Figure D103.1</td>
</tr>
<tr>
<td>Over 750</td>
<td></td>
<td>Special approval required</td>
</tr>
</tbody>
</table>
Fire Access Roads - Dead Ends

96' DIAMETER CUL-DE-SAC

60-FOOT "Y"

MINIMUM CLEARANCE AROUND A FIRE HYDRANT

120' HAMMERHEAD

ACCEPTABLE ALTERNATIVE TO 120' HAMMERHEAD

FIGURE D103.1
DEAD-END FIRE APPARATUS ACCESS ROAD TURNAROUND
Secondary Access Requirements

- 3 Triggers for secondary access...
  - Single-Family
  - Multi-family
  - Commercial

- Remoteness: Where two fire apparatus access roads are required, they shall be placed a distance apart equal to not less than ½ the length of the maximum overall diagonal dimension of the lot or area to be served, measured in a straight line between accesses.
Residential Developments

- Single-Family
  - >30 homes, unless sprinklered, then up to 60

Delete Code Section: IFC D107.1 Exception #2
Replace with the following language:

2. The number of dwelling units on a single fire apparatus access road shall not be increased unless alternative fire and life safety measures have been provided, as determined by the fire code official. When alternative fire and life safety measures have been implemented, at no time shall the number of dwelling units on a single fire apparatus access road exceed 60 units.
Residential Developments (example)
Multi-Family

- Multiple-family residential projects having more than 100 dwelling units shall be equipped throughout with two separate and approved fire apparatus access roads.

- **Exception:** 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 approved automatic sprinkler systems installed in accordance with Section 903.3.1.1 or 903.3.1.2.

- 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.
Commercial Secondary Access

- Buildings exceeding 62,000 sqft in area. Buildings or facilities having a gross building area of more than 62000 sqft shall be provided with 2 separate and approved apparatus access roads.

- Exception: Projects having a gross building area up to 124,000 sqft that have a single approved fire apparatus access road when all buildings are equipped throughout with approved automatic sprinkler systems.

- Remoteness: Where two fire apparatus access roads are required, they shall be placed a distance apart equal to not less than \( \frac{1}{2} \) the length of the maximum overall diagonal dimension of the lot or area to be served, measured in a straight line between accesses.
Aerial Access Roads

- Where the vertical distance between the grade plane and the highest roof surface exceeds 30 feet (9144 mm), approved aerial fire apparatus access roads shall be provided.
  - For purposes of this section, the highest roof surface shall be determined by measurement to the eave of a pitched roof, the intersection of the roof to the exterior wall, or the top of parapet walls, whichever is greater.

- Aerial fire apparatus access roads shall have a minimum unobstructed width of 26 feet (7925 mm), exclusive of shoulders, in the immediate vicinity of the building or portion thereof.

- 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 ¼ of the perimeter of the building. D105.1 *(Modified by CICC to accommodate reasonable development.)*
Delete Code Section: IFC D105.3
Replace with the following language:

D105.3 Proximity to building.

At least one of the required access routes meeting this condition shall be positioned along a total of ¼ of the building perimeter and located within the minimum and a maximum dictated by the table below, Table D105.3. The arrangement of the aerial fire apparatus access road shall be approved by the fire code official and may be discontinuous with approval.

<table>
<thead>
<tr>
<th>Building Height (ft)</th>
<th>Distance from Building (ft)</th>
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</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>Maximum</td>
</tr>
<tr>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td>50</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Water Supply Requirements
Hydrant Layout

- IFC Section 507.5.1; where a portion of the facility or building hereafter constructed or moved into or within the jurisdiction is more than 400 feet 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.

- (Exception: R-3, U & sprinklered buildings shall be 600 ft).
Fire Hydrants Near FDCs

Delete Code Section: IFC 507.5.1.1

Replace with the following language:

507.5.1.1 Hydrant for fire department connections.

Buildings equipped with a fire department connection installed in accordance with Section 912 shall have a fire hydrant located on a fire access road within 100 feet (30 m) of the fire department connection as measured by an approved route around the exterior of the building.

Exception: The distance shall be permitted to exceed 100 feet (30 m) where approved by the fire code official.
Delete Code Section: IFC 507.5.5
Replace with the following language:

507.5.5 Clear space around hydrants.

A 5-foot (1524 mm) horizontal clear space shall be maintained around the circumference of fire hydrants, as measured from the center-point of the hydrant, except as otherwise required or approved.
Insert New Code Section: IFC 507.5.8
Insert the following language:

507.5.8 Fire Hydrant Installation. Fire hydrants shall be installed with the grade mark on the fire hydrant at the level of finished grade. The large diameter connection shall be installed such that the connection is oriented facing the fire department access road.
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.

Fire-flow when sprinklers are present:

B105.3 Water supply for buildings equipped with an automatic sprinkler system. For buildings equipped with an approved automatic sprinkler system, the water supply shall be capable of providing the greater of:

1. The automatic sprinkler system demand, including hose stream allowance.
2. The required fire-flow.
How is fire-flow determined?

SECTION B105
FIRE-FLOW REQUIREMENTS FOR BUILDINGS

B105.1 One- and two-family dwellings, Group R-3 and R-4 buildings and townhouses. The minimum fire-flow and flow duration requirements for one- and two-family dwellings, Group R-3 and R-4 buildings and townhouses shall be as specified in Tables B105.1(1) and B105.1(2).

B105.2 Buildings other than one- and two-family dwellings, Group R-3 and R-4 buildings and townhouses. The minimum fire-flow and flow duration for buildings other than one- and two-family dwellings, Group R-3 and R-4 buildings and townhouses shall be as specified in Tables B105.2 and B105.1(2).
# APPENDIX B

**FIRE-FLOW REQUIREMENTS FOR BUILDINGS**

<table>
<thead>
<tr>
<th>FIRE-FLOW CALCULATION AREA (square feet)</th>
<th>AUTOMATIC SPRINKLER SYSTEM (Design Standard)</th>
<th>MINIMUM FIRE-FLOW (gallons per minute)</th>
<th>FLOW DURATION (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-3,600</td>
<td>No automatic sprinkler system</td>
<td>1,000</td>
<td>1</td>
</tr>
<tr>
<td>3,601 and greater</td>
<td>No automatic sprinkler system</td>
<td>Value in Table B105.1(2)</td>
<td>Duration in Table B105.1(2) at the required fire-flow rate</td>
</tr>
<tr>
<td>0-3,600</td>
<td>Section 903.3.1.3 of the International Fire Code or Section P2904 of the International Residential Code</td>
<td>500</td>
<td>1/2</td>
</tr>
<tr>
<td>3,601 and greater</td>
<td>Section 903.3.1.3 of the International Fire Code or Section P2904 of the International Residential Code</td>
<td>1/2 value in Table B105.1(2)</td>
<td>1</td>
</tr>
</tbody>
</table>

For SI: 1 square foot = 0.0929 m², 1 gallon per minute = 3.785 L/min.
<table>
<thead>
<tr>
<th>Type IA and IB*</th>
<th>Type IIA and IIIA*</th>
<th>Type IV and V-A*</th>
<th>Type IB and IIIB*</th>
<th>Type V-B*</th>
<th>FIRE-FLOW (gallons per minute)*</th>
<th>FLOW DURATION (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-22,700</td>
<td>0-12,700</td>
<td>0-8,200</td>
<td>0-5,900</td>
<td>0-3,600</td>
<td>1,500</td>
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<tr>
<td>22,701-30,200</td>
<td>12,701-17,000</td>
<td>8,201-10,900</td>
<td>5,901-7,900</td>
<td>3,601-4,800</td>
<td>1,750</td>
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</tr>
<tr>
<td>30,201-38,700</td>
<td>17,001-21,800</td>
<td>10,901-12,900</td>
<td>7,901-9,800</td>
<td>4,801-6,200</td>
<td>2,000</td>
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<tr>
<td>38,701-48,300</td>
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<td>9,801-12,600</td>
<td>6,201-7,700</td>
<td>2,250</td>
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<tr>
<td>48,301-59,900</td>
<td>24,201-33,200</td>
<td>17,401-21,300</td>
<td>12,601-15,400</td>
<td>7,701-9,400</td>
<td>2,500</td>
<td></td>
</tr>
<tr>
<td>59,001-70,600</td>
<td>33,201-39,700</td>
<td>21,301-25,500</td>
<td>15,401-18,300</td>
<td>9,401-11,300</td>
<td>2,750</td>
<td></td>
</tr>
<tr>
<td>70,601-83,700</td>
<td>39,701-47,100</td>
<td>25,501-30,100</td>
<td>18,401-21,800</td>
<td>11,301-13,400</td>
<td>3,000</td>
<td></td>
</tr>
<tr>
<td>97,701-112,700</td>
<td>54,901-63,400</td>
<td>35,201-40,600</td>
<td>25,901-29,300</td>
<td>15,601-18,000</td>
<td>3,500</td>
<td></td>
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<tr>
<td>112,701-128,700</td>
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<td>40,601-46,400</td>
<td>29,301-33,500</td>
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<td>3,750</td>
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<td>145,901-164,200</td>
<td>82,101-92,400</td>
<td>52,501-59,100</td>
<td>37,901-42,700</td>
<td>23,301-26,300</td>
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<td>164,201-183,400</td>
<td>92,401-103,100</td>
<td>59,101-66,000</td>
<td>42,701-47,700</td>
<td>26,301-29,300</td>
<td>4,500</td>
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<tr>
<td>183,401-203,700</td>
<td>103,101-114,600</td>
<td>66,001-73,300</td>
<td>47,701-53,000</td>
<td>29,301-32,600</td>
<td>4,750</td>
<td></td>
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<tr>
<td>203,701-225,200</td>
<td>114,601-126,700</td>
<td>73,301-81,100</td>
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<td>32,601-36,000</td>
<td>5,000</td>
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<td>81,101-89,200</td>
<td>58,601-65,400</td>
<td>36,001-39,600</td>
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<tr>
<td>247,701-271,200</td>
<td>139,401-152,600</td>
<td>89,201-97,700</td>
<td>65,401-70,600</td>
<td>39,601-43,400</td>
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<tr>
<td>271,201-295,900</td>
<td>152,601-166,500</td>
<td>97,701-106,500</td>
<td>70,601-77,000</td>
<td>43,401-47,400</td>
<td>5,750</td>
<td></td>
</tr>
<tr>
<td>295,901-Greater</td>
<td>166,501-Greater</td>
<td>106,501-115,800</td>
<td>77,001-83,700</td>
<td>47,401-51,500</td>
<td>6,000</td>
<td></td>
</tr>
</tbody>
</table>

For SI: 1 square foot = 0.0929 m², 1 gallon per minute = 3.785 L/min, 1 pound per square inch = 6.895 kPa.
a. Types of construction are based on the International Building Code.
b. Measured at 20 psi residual pressure.
Benefit for Sprinklers

- Required fire flow can be reduced based on the presence of sprinklers.
- Need to use Table B105.2 to determine the required fire flow.
- This must be compared to the fire flow per B105.3 to confirm actual required fire flow.

<table>
<thead>
<tr>
<th>AUTOMATIC SPINKLER SYSTEM</th>
<th>MINIMUM FIRE-FLOW (gallons per minute)</th>
<th>FLOW DURATION (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No automatic sprinkler system</td>
<td>Value in Table B105.1(2)</td>
<td>Duration in Table B105.1(2)</td>
</tr>
<tr>
<td>Section 903.3.1.1 of the International Fire Code</td>
<td>25% of the value in Table B105.1(2)</td>
<td>Duration in Table B105.1(2) at the reduced flow rate</td>
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<tr>
<td>Section 903.3.1.2 of the International Fire Code</td>
<td>25% of the value in Table B105.1(2)</td>
<td>Duration in Table B105.1(2) at the reduced flow rate</td>
</tr>
</tbody>
</table>

For SI: 1 gallon per minute = 3.785 L/min.

a. The reduced fire-flow shall be not less than 1,000 gallons per minute.
b. The reduced fire-flow shall be not less than 1,500 gallons per minute.
Example: Fire Flow for Townhomes

- 5 row homes (townhomes)
  - 2,200 ft² each
  - 11,000 ft² total building area
- Wood frame (type V-b construction)
- Non-sprinklered
  - Vs
- Sprinklered
Example: Fire Flow for Commercial Building

- Commercial office building
  - 45,000 ft² total building area
- Non-sprinklered
- Wood frame (Type V-B construction) vs Type II A
Example: Fire Flow for Commercial Building

- Commercial office building
  - 45,000 ft² total building area
- Sprinklered - NFPA 13
- Wood frame (Type V-B construction) vs Type II A

<table>
<thead>
<tr>
<th>Fire Flow Calculation Area (square feet)</th>
<th>Type IA and IB*</th>
<th>Type IA and IIIA*</th>
<th>Type IV and V-A*</th>
<th>Type IIIB and IVB*</th>
<th>Type V-B*</th>
<th>Fire Flow (gallons per minute)</th>
<th>Flow Duration (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-27,700</td>
<td>0-12,700</td>
<td>0-8,200</td>
<td>0-5,900</td>
<td>0-3,600</td>
<td>1,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27,701-33,200</td>
<td>12,701-17,200</td>
<td>8,201-13,700</td>
<td>5,901-11,400</td>
<td>3,600-18,000</td>
<td>2,500</td>
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</tr>
<tr>
<td>33,201-48,500</td>
<td>17,201-21,700</td>
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<td>11,401-16,900</td>
<td>18,001-23,500</td>
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<td>19,201-24,700</td>
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<td>23,501-29,000</td>
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<tr>
<td>59,001-70,400</td>
<td>27,201-32,700</td>
<td>24,701-30,200</td>
<td>22,401-28,900</td>
<td>29,001-34,400</td>
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<tr>
<td>70,401-83,700</td>
<td>32,701-38,200</td>
<td>30,201-35,700</td>
<td>28,901-33,400</td>
<td>34,401-39,900</td>
<td>750</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3,000 gpm * .25 = 750 gpm (but can’t be lower than 1,000 gpm - footnote a) for 3 hours

5,750 gpm * .25 = 1440 gpm for 4 hours
Performance Alternatives

- **Type of Construction**
  - Non-combustible construction when wood frame is allowed

- **Sprinkler Protection**
  - NFPA 13 when NFPA 13R is required
    - Access limitations
    - Aerial access limitations
Example of An Alternative Design

- Multi-building “lot”
  - A skywalk “node”
  - A multi-purpose commercial building
    - Restaurant 1st floor (A-2)
    - Office (B) 2nd & 3rd floors
  - 5-6 story residential
- Two buildings will exceed 30’ and require aerial access
- Lot is intended to be divided to allow buildings to be owned and financed separately.
- There is an elevation change North to South on the lot that prevents through access on the site.
Alternative Design Discussion

- Unable to meet the Aerial Access Requirements
- No inter-site aerial access
- Alternative Design
  - All buildings on the site non-combustible construction
    - Potentially the 3 Story commercial could have been combustible construction
    - Potentially the residential building could have been Podium style construction
  - NFPA 13 sprinkler systems
    - Potential for unsprinklered 3-story
    - Potential for 13R sprinkler system in the Residential occupancy
Odds & Ends

- Address Identification
- Undeveloped areas - hydrants per Appendix C
- Adding on to an Existing Building
- Tanks and Impact protection
- High-Rise Specific Requirements
- Using Autoturn to Verify
- Access during construction
- Phased projects (temporary turn-arounds)
505.1 Address identification.

New and existing buildings shall have approved address numbers, building numbers or approved building identification placed in a position that is plainly legible and visible from the street or road fronting the property. These numbers shall be black or white and shall contrast with their background. Where required by the fire code official, address numbers shall be provided in greater dimension or additional approved locations to facilitate emergency response. Address numbers shall be Arabic numbers or alphabetical letters. Numbers and letters shall be a minimum height and a minimum stroke width as dictated by Table 505.1. 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 numbers shall be maintained.
Address Identification

**Table 505.1**
Minimum Height and Stroke Width\(^a\) \(^b\)

<table>
<thead>
<tr>
<th>Distance from the centerline of the Public Way (ft)</th>
<th>Minimum Height (in)</th>
<th>Minimum Stroke Width (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 100</td>
<td>4</td>
<td>1/2</td>
</tr>
<tr>
<td>100</td>
<td>199</td>
<td>6</td>
</tr>
<tr>
<td>200</td>
<td>299</td>
<td>8</td>
</tr>
<tr>
<td>For each additional 100</td>
<td>Increase 2</td>
<td>Increase 1/2</td>
</tr>
</tbody>
</table>

\(^a\) Exterior suite identification, minimum height shall be 4 inches and stroke width shall be \(1/2\) inch.

\(^b\) Interior suite identification, minimum height shall be 2 inches and stroke width shall be \(1/4\) inch.
All additions must meet access, hydrant, and other IFC site plan requirements.

Additionally, when possible, existing nonconforming situations should be remedied, alleviated, or improved.

At a minimum the addition must not make an existing non-conforming situation worse vis-à-vis access.

Additions of sprinklers to existing buildings may not trigger the requirement for the FDC to be located within 100’ of a hydrant.
Impact Protection

312.2 Posts. Guard posts shall comply with all of the following requirements:

1. Constructed of steel not less than 4 inches (102 mm) in diameter and concrete filled.
2. Spaced not more than 4 feet (1219 mm) between posts on center.
3. Set not less than 3 feet (914 mm) deep in a concrete footing of not less than a 15-inch (381 mm) diameter.
4. Set with the top of the posts not less than 3 feet (914 mm) above ground.
5. Located not less than 3 feet (914 mm) from the protected object.
High-Rise Specific Requirements

- Redundant FDC
- Redundant Water Supply
Using Autoturn to Verify

- The template to use for DMFD apparatus is available on our website:

**DMFD Apparatus Data Used with AutoTurn:**

<table>
<thead>
<tr>
<th>Width</th>
<th>9'-11”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Track</td>
<td>8'-5”</td>
</tr>
<tr>
<td>Lock to Lock Time</td>
<td>4.4 seconds</td>
</tr>
<tr>
<td>Steering Angle</td>
<td>31.1 degrees</td>
</tr>
</tbody>
</table>

**Other Useful DMFD Apparatus Information:**

- Angle of Approach: Less than 10 degrees
- Angle of Departure: Less than 7.5 degrees
- Undercarriage Clearance: 8”
Insert New Code Section: IFC Section 3310.1.1

Language:

Section 3310.1.1 Construction Site Access. Approved fire apparatus access roads shall be provided for every facility, building or portion of a building as soon as construction commences. The fire apparatus access road shall comply with the requirements of Section 503.2 and this section and shall extend to within 100 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.

Exception: The fire code official is authorized to increase the dimension of 100 feet (45 720 mm) where:

1. The building is equipped throughout with an approved automatic sprinkler system that is fully functional and installed in accordance with Section 903.3.1.1, 903.3.1.2 or 903.3.1.3.

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.
Phased Projects

- If a dead-end is created (beyond 150 feet) then a turn-around is required
  - Even if future connection will allow for a through access