Fire Service Features – Chapter 5

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After completing this session, the student will be able to:

- Review the requirements of the state fire code’s fire service features
- Assess the local policies related to fire service features
- Identify features for fire department access and water supply
- Apply fire department access and water supply requirements to a planned building
Fire Service Features – MSFC Chapter 5

- Many of these features are best addressed during:
  - Development review
  - Early site plan review
- Provisions are really about time:
  - Assist with rapid and efficient fire department operations
- This is the FD’s opportunity to have input
MSFC Chapter 5 – Format & Sections

• 501 – General
• 502 – Definitions
• 503 – Fire Apparatus Access Roads
• 504 – Access to Building Openings and Roofs
• 505 – Premise Identification
• 506 – Key Boxes
MSFC Chapter 5 – Format & Sections

- 507 – Fire Protection Water Supplies
- 508 – Fire Command Center
- 509 – Fire Protection and Utility Equipment Identification and Access
- 510 – Emergency Responder Radio Coverage (not adopted and moved to optional Appendix P)
Fire Apparatus Access to Buildings

Definitions
Fire Apparatus Access Road

• Provides access to a facility or building
• Includes streets, fire lanes, parking lots and access roadways
Fire Lane

• Allows passage of fire apparatus
• Not necessarily intended for other vehicles
F.D. Access Requirements

MSFC 503
F.D. Access – MSFC 503.1.1

- Required for new facilities, buildings and additions
- Must be able to get apparatus within 150 ft. of all portions of the building
- How far away from building?:
  - No minimums specified
  - Aerial apparatus considerations
F.D. Access – MSFC 503.1.1

Alley or fire access road
F.D. Access – MSFC 503.1.1
150 foot maximum distance
How the 150 foot maximum distance is measured
F.D. Access – Building Addition

New Addition

Existing Building

200 Ft.
F.D. Access – Building Addition

Existing Building

New Addition

200 Ft.
F.D. Access – MSFC 503.1.1

- Exception: FD access roads are not required when the road serves two or fewer:
  - Group R-3 (single family homes)
  - Group U (garages, barns, sheds, etc.)
• Distance increases allowed (can increase the 150 ft. distance):
  – Is sprinklered commercial: no maximum distance
  – Group R sprinkler-protected buildings (up to 600 feet)
  – Difficult location/topography and alternative means of fire protection provided (up to 300 feet)
Fire apparatus roads can terminate further from the house when sprinkler-protected.
Specifications for Access Roads

MSFC 503.2
F.D. Access Road Width – MSFC 503.2.1

- 20 foot minimum width
- Exception added for sprinkler-protected residences – 16 ft. width
F.D. apparatus access roads can be narrower if sprinkler-protected buildings
Access Road Specifications

- MSFC 503.2.2 – Fire code official can require additional width if inadequate for fire or rescue operations
- MSFC 503.2.3 – Capable of supporting the loads of apparatus in all weather conditions
- MSFC 503.2.4 – Turning radius of fire apparatus must be met
- MSFC 503.2.5 – Dead-end turn-around provisions required
Access Road Specifications

- MSFC 503.2.6 – Bridges and elevated surfaces to be designed to handle the live load of the apparatus
- MSFC 503.2.7 – Road grade to be determined by local fire apparatus specifications
- MSFC 503.2.8 – Approach and departure angles based on local fire apparatus specifications
Increase Width for Certain Conditions
Apparatus Turning Radius – MSFC 503.2.4

Longest Vehicle: Truck 101

Specifications
Inside to Inside = 29' 10"
Curb to Curb = 4' 10 1/2"
Wall to Wall = 39' 3 1/2"
Access Road Turn-Around – MSFC 503.2.5

• Turn-around provisions if FD access road is over 150 ft. in length
• Turn-around provisions will vary depending on local FD needs or equipment
• Exception allows 300 ft. dead-end road for sprinkler-protected Group R buildings
Fire Department Access – MSFC 503

No Fire Sprinkler

20’

200’

400’

20’
Fire Lane Marking and Signage – MSFC 503.3

• Fire code official can require the posting and marking of fire lanes
• Develop local ordinance for sign specifications
• Appendix D has guidance (D103.6)
Fire Lane Marking and Signage

- Curb painting is common in other areas of the country
- Not common in Minnesota due to snow cover
Premise Identification – MSFC 505.1

- Approved address numbers or building identification
- Plainly legible and visible from street
- Can require at additional locations
- Numbers to be at least 4” height and ½” stroke
- Address numbers to be maintained
Fire Department Key Boxes

MSFC 506
Key Boxes – MSFC 506

- Code official can require key boxes:
  - To provide access to or within structure
- Approved location
- Approved type of key box
- Containing keys to gain access as required
- Must be maintained (new keys, etc.)
F.D. Key Boxes – MSFC 506

- 506.1 Where required. Where access to or within a structure or an area is unduly difficult because of secured openings or where immediate access is necessary for life-saving or fire-fighting purposes, the fire code official is authorized to require a key box to be installed in an approved location. The key box shall be of an approved type and shall contain keys to gain necessary access as required by the fire code official.
  - Exception: One and two family dwellings need not be provided with lock boxes.
When to Require Key Boxes?

- Sprinkler systems
- Fire alarm systems
- Apartment buildings
  - Medical emergencies
- Hotels
  - But they are always open
- Elevators with communication

- No fire protection systems?
- Convenience stores?
- Security concerns:
  - Banks
  - Jewelry stores
  - Data centers
Convenience Store

Open 24 Hours
Bank

No alarms and no sprinklers
Security concerns
Type of Keys in Key Box

- Building access
- Sprinkler control room
- Mechanical & electrical
- Fire alarm panel / pull station key
- Apartment master key?
Department Policy or Directive

- Written policy highly recommended
- Specify type of key boxes (manufacturer)
- Who oversees the key box program
- Instructions for installing key boxes:
  - Location, height, etc.
- Distribution and security of keys
- When key boxes can be accessed
Key Box & Key Security

- You’re the fire code official
- Fire officer walks into your office
  - “Can we talk?”
  - “I can’t find my key box key”
- Key security
  - Regular audits
  - Daily vehicle check
  - Security in vehicles
Phoenix Fire Department can't account for 850 keys
April 14, 2014
More than half of the keys gone missing, officials said
City paying about $50,000 to re-key all 9,000 boxes in 12 weeks
Originally had 1,350 keys issued
Seattle spending $500,000 to re-key lock boxes after burglaries

October, 2013

Burglars were accessing key boxes, taking keys and entering the buildings
What if Owner Refuses the Key Box?

- Key box required as part of your site plan review
- They’ve read the headlines across the country
  - Missing or stolen keys or misused
- Right to appeal your requirements
- Better solution to indemnify the fire department and hold harmless any damage at an incident?
Firefighting Water Supplies

MSFC 507
• Approved water supply to be provided:
  - Applies to new buildings & additions to existing buildings
• Capable of supplying minimum flows
• Types:
  - Reservoirs, tanks
  - Water mains
  - Other fixed systems
<table>
<thead>
<tr>
<th>Hazard Classification</th>
<th>Unsprinklered or partially sprinklered building</th>
<th>Duration (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Hazard</td>
<td>250 gpm available for FD use</td>
<td>30</td>
</tr>
<tr>
<td>Ordinary Hazard</td>
<td>500 gpm available for FD use</td>
<td>60</td>
</tr>
<tr>
<td>Extra Hazard</td>
<td>750 gpm available for FD use</td>
<td>90</td>
</tr>
<tr>
<td>High Piled Combustible Storage</td>
<td>1000 gpm available for FD use</td>
<td>120</td>
</tr>
<tr>
<td>Other Group H Occupancies</td>
<td>1000 gpm available for FD use</td>
<td>120</td>
</tr>
<tr>
<td>Hazard Classification</td>
<td>Sprinklered Building</td>
<td>Duration (minutes)</td>
</tr>
<tr>
<td>---------------------------------------</td>
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</tr>
<tr>
<td>High Piled Combustible Storage</td>
<td>Hose stream demand from NFPA 13 or 500 gpm, whichever is larger.</td>
<td>120</td>
</tr>
<tr>
<td>Other Group H Occupancies</td>
<td>Hose stream demand from NFPA 13, MSFC Chapters, or 500 gpm, whichever is larger.</td>
<td>120</td>
</tr>
</tbody>
</table>
The Age-Old Question

• The owner is building outside the city where there is no water so they cannot provide:
  – Water for firefighting
  – Sprinkler protection
• Sorry – wrong answer
• No municipal water supply shifts the responsibility to property owner
Fire Protection Water Supplies – MSFC 507.5.1

- Requires any portion of a building to be within 300 ft. of a hydrant
- Can increase distance to 400 ft. if the building is sprinkler-protected
- Can increase distance to 600 ft. if Group R-3 occupancy and sprinkler-protected
Increased hydrant spacing:

- 1 & 2 family dwellings
- Miscellaneous (Group U) occupancies
Hydrant Spacing – Commercial

Increased hydrant spacing if sprinkler-protected commercial building
Hydrant Spacing – Residential (R-3)

Increased hydrant spacing if sprinkler-protected Group R-3 buildings
Hydrant for Standpipes – MSFC 507.5.1.1

- Fire hydrant to be located within 100 ft. of standpipe fire department connection (FDC)
- Does not apply to sprinkler system FDCs
- Exception allows an increase where acceptable to fire code official
Hydrant for Standpipes – MSFC 507.5.1.1

100 ft. max
Access & Water Supplies – MSFC 503 & 507

New Building

150 ft.

300 ft.

400 ft.

ROAD
Access Roads & Water Supplies

- MSFC allows a great deal of flexibility for sprinklered buildings
- FD access and water supply requirements are closely related:
  - A hydrant is of little value if you cannot drive a fire truck to it
  - They use 150 ft. as a basis (length of typical pre-connected hose line)
Access Roads & Water Supplies
More Does Not Always Mean Better
Hydrant Obstructions – MSFC 507.5.4

- Cannot obstruct hydrants or other fire protection system controls
Fire Hydrant Protection – MSFC 507.5

- Must maintain 3 ft. clear space around hydrants – MSFC 507.5.5
- Can require posts if hydrant is subject to vehicle impact – MSFC 507.5.6
Fire Command Centers

MSFC 508
Fire Command Center – MSFC 508.1.1 & 508.1.2

- Location to be approved by fire code official
- One-hour fire separated from the remainder of building
Fire Command Center – MSFC 508.1.3

- Size and dimensions of room:
  - 200 sq. ft. or 0.015% of building size (whichever is greater)
  - Previous codes allowed 96 sq. ft.
  - Minimum dimension of:
    - 0.7 times $\sqrt{\text{of room}}$ – or –
    - 10 ft. (whichever is greater)
Fire Command Center Features – MSFC 508.1.6

- Extensive list of features that are required in fire command centers:
  - Voice/alarm communication system
  - Fire alarm and detection annunciator
  - Elevator location annunciator
  - Controls for smoke management systems
  - Controls for unlocking interior stairway doors
  - Sprinkler and fire pump status indicators
  - See MSFC 508.1.6 for additional provisions
Fire Protection & Utility Identification & Access

MSFC Section 509
• Fire protection equipment to be identified
• Rooms containing the following to be identified:
  – Sprinkler risers and valves
  – Fire alarm, detection or suppression controls
  – Air conditioning systems
Signage & Identification – MSFC 509.1

FACP & SPRINKLER/FIRE PUMP CONTROL ROOM

SPRINKLER CONTROL ROOM

SPRINKLER CONTROL VALVE
Utility Identification – MSFC 509.1.1

• Certain utility equipment to be identified:
  – Gas shut-off valves
  – Electric meters
  – Switches
  – Other utility equipment

• Identifies space or unit that it serves
Utility Shut-offs Labeled – MSFC 509.1.1
Access to Equipment – MSFC 509.2

- Access to be provided for fire protection equipment
- When needed for immediate operation and maintenance
- No storage, trash or materials to prevent access to equipment
Access to Equipment – MSFC 509.2
Access to Equipment – MSFC 509.2
Emergency Responder Radio Coverage

MSFC 510
Emergency Responder Radio Coverage

- Section 510 was added to the 2012 IFC requiring emergency responder radio coverage for all new buildings
- MSFC moved this to an optional appendix chapter (Appendix P)
Resources for Fire Code Officials
Site Plan Review Checklist
WHAT'S NEW?

Plans in place to help fire departments keep their communities safe

We are working closely with Twin Cities fire departments and others across the state to ensure they have the resources they need to keep people and property in their communities safe during the trial for former Minneapolis police officer Derek Chauvin.

We can work with the Minnesota State Fire Chiefs Association to activate the statewide mutual aid plan quickly to send help anywhere in the state.

Firefighter Recruitment Grant Information

The Minnesota State Fire Department Association (MSFDA) is holding informational sessions every other week on Tuesday and Thursday at 7 p.m. to discuss their Firefighter Recruitment Grant. Each one-hour meeting will go over the recruitment grant and provide details on new resources to improve your department’s firefighter recruitment efforts.

The grant period began Dec. 10, 2020, and will run for four years. 

Click here to learn more and to sign up.
FIRE CODE

General information

The links to the left take you to our information sheets, interpretations, policies, sample inspection checklists, the Minnesota State Fire Code and a new link to fire code training presentations.

The majority of the information sheets, policies and interpretations have not been updated to the 2020 Minnesota State Fire Code. The process to update will take some time to complete. When an information sheet, policy or interpretation has been updated, it will be noted with *2020 MSFC.

Contact us

Fire code questions may be submitted by emailing the Fire Code Team.

Fire sprinkler questions may be submitted directly to the Fire Protection Team.

Code staff monitor this email address on a daily basis and will respond to your question, usually within 24 hours, but always within three working days.
SAMPLE INSPECTION CHECKLISTS

Sample Inspection Checklists

These documents are intended as a resource for inspection staff that perform inspections in accordance with the 2015 Minnesota State Fire Code (MSFC). They can be used as-is or as a guide to develop customized forms for a particular jurisdiction.

When a sample inspection checklist has been updated, it will be noted with *2020 MSFC.

- Apartment buildings sample inspection checklist. *2020 MSFC
- Assembly occupancies sample inspection checklist.
- Business occupancies sample inspection checklist. *2020 MSFC
- College classroom and lecture buildings sample inspection checklist. *2020 MSFC
- Educational occupancies sample inspection checklist. *2020 MSFC
- Fire department site plan review sample inspection checklist.
- Home daycare and foster care inspection checklist.
- Mobile food preparation vehicle inspection checklist. *2020 MSFC
- Public fireworks display sample inspection checklist.
# Site Plan Review Checklist (Word Form-Fill)

## Fire Department Site Plan Review Checklist

**Minnesota State Fire Code**

### Project / Point of Contact Information

- **Project Name**: Click here to enter text.
- **Address**: Click here to enter text.
- **Contact Name**: Click here to enter text.  
  **Contact Phone**: Click here to enter text.
- **Contact Address**: Click here to enter text.
- **Contact Email**: Click here to enter text.

### Designer / Engineer Information

- **Company Name**: Click here to enter text.
- **Address**: Click here to enter text.
- **Contact Name**: Click here to enter text.  
  **Contact Phone**: Click here to enter text.
- **Contact Email**: Click here to enter text.

### Project Type (if multi-use development, check all that apply)

- [ ] Assembly
- [ ] Business
- [ ] Educational
- [ ] Factory/Industrial
- [ ] Hazardous
- [ ] Institutional
- [ ] Mercantile/Retail
- [ ] Residential – Multi-unit
- [ ] Residential – 1&2 Family
- [ ] Storage/Warehouse
- [ ] Utility/Miscellaneous
- [ ] Other: Click here to enter text.

### Description/Comments

Click here to enter text.

### Construction Type (if multiple types, check all that apply)

- [ ] Type I-A (Noncombustible Fire Resistant)
- [ ] Type I-B (Noncombustible Fire Resistant-Modified)
- [ ] Type II-A (Protected Noncombustible)
- [ ] Type II-B (Unprotected Noncombustible)
- [ ] Type III-A (Protected Combustible)
- [ ] Type III-B (Unprotected Combustible)
- [ ] Type IV (Heavy Timber)
- [ ] Type V-A (Protected Wood Frame)
- [ ] Type V-B (Unprotected Wood Frame)
Questions

Website: https://sfm.dps.mn.gov
Thank you

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