



# MOBILE FIRE - RESCUE DEPARTMENT FIRE CODE ADMINISTRATION

## Water Mist System Plan Review 2012 International Fire Code and NFPA 750

Date of Review \_\_\_/\_\_\_/\_\_\_\_\_ BLD201\_\_ - \_\_\_\_\_

Project Address: \_\_\_\_\_ Project Name: \_\_\_\_\_

Professional Engineer's Name: \_\_\_\_\_ Phone: \_\_\_\_\_

Contractor's Business Name: \_\_\_\_\_ Phone: \_\_\_\_\_

Contractors Name: \_\_\_\_\_ Phone: \_\_\_\_\_

Contractor's Email Address: \_\_\_\_\_

System Application: Local \_\_\_ Total Compartment: \_\_\_ Zoned: \_\_\_

Design: Pre-Engineered \_\_\_ Engineered: \_\_\_

System Type: Low Pressure \_\_\_ Intermediate Pressure \_\_\_ High Pressure: \_\_\_\_\_

Nozzle Type: Auto \_\_\_ Non-Auto \_\_\_ Hybrid \_\_\_\_\_

---

Numbers following worksheet comments represent an NFPA code section unless otherwise specified.

**Worksheet Legend:** ✓ or OK = acceptable      N = need to provide      NA = not applicable

1. \_\_\_ Two sets of drawings are provided.

2. \_\_\_ Equipment is listed for intended use and compatible with the system and equipment data sheets are provided.

**Plan Set Shall Provide and Detail the Following : General:**

3. \_\_\_\_\_ Scale: a common scale shall be used and plan information is legible.
4. \_\_\_\_\_ Description of the water and gas storage containers including internal volume, design pressure at standard temperature and pressure, .
5. \_\_\_\_\_ Building dimensions, location of fire partitions and fire walls.
6. \_\_\_\_\_ Description of the hazards or occupancies being protected and if these areas are occupied,
7. \_\_\_\_\_ Full-height cross sections, which include ceiling construction.
8. \_\_\_\_\_ System application, nozzle type, operation method, and media type.
9. \_\_\_\_\_ Device and nozzle location, provide sectional view detailing detectors position.
10. \_\_\_\_\_ Type of devices and detail proper device wiring for detectors, horns, etc.
11. \_\_\_\_\_ Equipment symbol legend and compass point.
12. \_\_\_\_\_ Water mist control panel location is detailed and connected to the building fire alarm system, if the building is equipped with such a system.
13. \_\_\_\_\_ Sequence of operation for operation of the water mist system, .

**Detection System Riser,**

14. \_\_\_\_\_ Riser diagram shows the number and type of devices, audible, visual, release, shutdown, and discharge controls, per circuit, zone ID, a dedicated 120 AC power supply, batteries, panel, etc.

**Point to Point System Wiring Diagram,:**

15. \_\_\_\_\_ Interconnection and wire routing to identified devices and controls per circuit.
16. \_\_\_\_\_ Indicate the number of conductors and wire gauge for each circuit.
17. \_\_\_\_\_ Identify separate zones, circuits, and end of line resistor locations.

**Circuit Loads, Voltage Drop Calculations, and Battery Calculations,**

18. \_\_\_\_\_ Quantity of signaling devices, current consumption, and end-of-line voltage for each circuit.
19. \_\_\_\_\_ Based on the approximate length of each circuit and the conductor amperage, determine the resistance for each 1,000 feet of wire using *National Electrical Code* ampacity values or those specified by the manufacturer of the conductors.

20. \_\_\_\_\_ Show the formula and acceptable circuit limits on the drawing or on an attached sheet including:
21. \_\_\_\_\_ A. Standby power consumption of all current drawing devices multiplied by the hours required by NFPA (24 hours) including power consumption of the control panel modules.
22. \_\_\_\_\_ B. Power consumption of all devices on standby power; including door holders, relays, smoke detectors, etc.
23. \_\_\_\_\_ C. Alarm power consumption of all current drawing devices multiplied by the minutes required by NFPA (5 minutes).
24. \_\_\_\_\_ D. Formula format for battery calculations and size of batteries.

**System Devices:**

25. \_\_\_\_\_ Pre-engineered water mist automatic detection system layout meets the manufacturer's listing requirements and a specification/design manual is provided, . Alarm initiating and signaling devices are installed in accordance with NFPA 72.
26. \_\_\_\_\_ Equipment and detectors are listed for use and the listing data sheets are provided,
27. \_\_\_\_\_ Two sources of electrical power are provided (24-hr minimum standby power),
28. \_\_\_\_\_ Emergency release device is provided and detailed, unless each nozzle is thermally activated,
29. \_\_\_\_\_ Normal manual control(s) for activation is detailed to be accessible, labeled, and mounted 4 ft. or less above the floor level, .
30. \_\_\_\_\_ Pneumatic control lines are protected against damage and supervised,
31. \_\_\_\_\_ When automatic activation is provided, the method is designed in compliance with

**Water Mist Information:**

32. \_\_\_\_\_ Type of system, system application, type of nozzles, operation method, and media type are provided.
33. \_\_\_\_\_ Design objective and hazard classifications are provided,.
34. \_\_\_\_\_ Components subject to corrosion are protected, .

35. If required a FDC is detailed on the discharge side of pressure source and prior to the filter/strainer or on the suction side of the pressure source, depending on the operating pressure, .

**Calculations:**

36. \_\_\_\_\_ System hydraulic and atomizing medium calculations are provided in accordance with Chapter 9.

37. \_\_\_\_\_ Hydraulic calculation nodes match plan nodes.

38. \_\_\_\_\_ Hydraulic junction points balance within the pressure specified in 9 and equivalent pipe lengths are in accordance with .

39. \_\_\_\_\_ Nozzle pressures are within limitations specified by the manufacturer.

40. \_\_\_\_\_ The results of the hydraulic and pneumatic calculations at the supply point and at the nozzle are provided, .

41. \_\_\_\_\_ The water supply is designed for the largest single hazard or group of hazards,

42. \_\_\_\_\_ A volume and pressure of the propellant gas is in accordance with Section 9.

**Atomizing Media:**

43. \_\_\_\_\_ For twin fluid systems the atomizing media source shall be in accordance with Code

44. \_\_\_\_\_ Pump capacity is in accordance with .

45. \_\_\_\_\_ A test connection is detailed for testing the pump in accordance with

46. \_\_\_\_\_ When used, an air compressor is listed for fire service use,.

47. When used as the dedicated air supply, the compressor is connected to a backup power supply,.

**Containers and Piping:**

48. \_\_\_\_\_ Pressurized water and atomizing media containers shall meet the construction requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section VIII, *Unfired Pressure Vessels* or in accordance with U.S. Department of Transportation requirements, .

49. \_\_\_\_\_ Gas and water containers are sized for required quantities, , and are not located where environmental or mechanical damage will occur, .

50. \_\_\_\_\_ When required in a seismic design category, documentation explaining seismic bracing for atomizing media containers shall be provided, .

51. \_\_\_\_\_ Containers that are pressurized shall be equipped with a pressure relief device, .
52. \_\_\_\_\_ Manifold containers shall be interchangeable and have the same volume and discharge pressure, .
53. \_\_\_\_\_ Low pressure storage cylinder detail shows the liquid level and pressure gauges, and high/low pressure supervisory alarm,
54. \_\_\_\_\_ Pressure gauges are detailed on all pressurized cylinders, both sides of pressure regulator valve, pressurized side of the supply connections and system control valves, and air supplies for dry systems, .
55. \_\_\_\_\_ Pipe or tube: type of material, sizes, pressure rating, if used in low, intermediate, or high PSI system, and pipe specifications are provided, .
56. \_\_\_\_\_ Bending criteria for Type K and L copper pipe is noted on plans
57. \_\_\_\_\_ Fittings are either listed or meet the referenced ANSI or ASTM standard for the given application. Specifications or equipment data sheets are provided,
58. \_\_\_\_\_ Screwed unions are limited to pipe diameters of 2 inches or less
59. \_\_\_\_\_ One-piece reducers are used and noted on plans, .
60. \_\_\_\_\_ When required, an FDC is detailed and interfaces on the pressure side of the system,

**Hangers:**

61. \_\_\_\_\_ Hangers are listed for their intended use .
62. \_\_\_\_\_ Types of hangers and hanger locations on structural elements are detailed on plans, . Low pressure water pipe is hung in accordance with NFPA 13.
63. Armovers to nozzles are detailed and the supports shown for steel pipe and tube length greater than what is specified in NFPA 13.

**Seismic Bracing (Based on the requirements in NFPA 13):**

64. \_\_\_\_\_ Seismic bracing is designed, detailed, and seismic calculations are provided, NFPA
13. 65. \_\_\_\_\_ Lateral sway brace spacing
66. \_\_\_\_\_ A seismic separation assembly for piping is provided at building seismic joints,
67. \_\_\_\_\_ Longitudinal sway brace spacing complies with .

- 68.\_\_\_\_ A 4-way sway brace is provided at the top of the riser.
- 69.\_\_\_\_ Longitudinal and lateral bracing is provided for each run of pipe between the change of direction
- 70.\_\_\_\_ Branch lines and end sprinklers are restrained against vertical and lateral movement,
71. Calculations for seismic bracing are provided, .

**Nozzles:**

- 72.\_\_\_\_ Nozzles: All design and installation listing data for each nozzle is provided. The information shall include: specific hazard objectives, flow rate, space height; protection distance, spacing, coverage area, and pressures; delivery time, spacing from walls, compartment volume, and thermal classification, etc.,
- 73.\_\_\_\_ Thermal nozzles: nozzle temperature rating and the maximum ambient temperatures are provided .
- 74.\_\_\_\_ Number, type, and the placement of spare nozzles are noted on plans, .
- 75.\_\_\_\_ Nozzles with waterway dimensions less than 51 microns use the type of water

**Valves:**

- 76.\_\_\_\_ Valves are listed for the intended use, equipment data sheets are provided and valve signage is provided.
77. \_\_\_\_ A monitored or locked indicating valve is provided for each source of water supply,
- 78.\_\_\_\_ Water pressure regulating valve (PRV) is provided for any portion of the system with the potential to exceed the maximum system pressure rating and it opens at the percentage of system-rated pressure specified
- 79.\_\_\_\_ Water pressure relief valve size and location is detailed and in compliance with
- 80.\_\_\_\_ Indicating valve location is detailed and in compliance with .
- 81.\_\_\_\_ A water flow test valve is detailed and designed to meet the equivalent flow of PRV,
- 82.\_\_\_\_ Compressed gas PRV is detailed when the supply pressure is higher than the operating pressure,
- 83.\_\_\_\_ Check valve is detailed between the system and the potable water connection, .

84. \_\_\_\_\_ Pressure gauges are detailed on the pressurized side of control valves and supply connections.

**Strainers:**

85. \_\_\_\_\_ Strainers and filters are listed for their use and the listing data sheets are provided,

86. \_\_\_\_\_ Pipeline strainer and filter designs have a flush-out connection, .

87. \_\_\_\_\_ Number, type, and placement of spare strainers and filters are noted on the plans,

88. \_\_\_\_\_ Strainers and filters are detailed at each water supply connection or system riser,

89. \_\_\_\_\_ Strainer and filter ratings or mesh openings are of a percentage of the nozzle waterway dimension as specified in accordance with NFPA

**Pumps and Controllers:**

90. \_\_\_\_\_ An automatic pump is provided and detailed,

91. \_\_\_\_\_ Pump capacity is in accordance with NFPA.

92. \_\_\_\_\_ A test connection is detailed for testing the pump in accordance with NFPA

93. \_\_\_\_\_ Pumps: design information and details include pump capacity, over pressure relief, method of automatic start and shutoff and water supply method,

94. \_\_\_\_\_ Pumps are sized to provide the water flow rate and system demand,

95. \_\_\_\_\_ Pump operation and functions are supervised at a constantly attended location, method and what is supervised on the electrical and diesel pumps are noted on plans, .

96. \_\_\_\_\_ Power supply for pump driver complies with NFPA 20 except for being fed with an independent service feed, .

97. \_\_\_\_\_ Pump controller is a listed fire pump controller

**Test Connector:**

98. \_\_\_\_\_ It is detailed and it is sized not less than the largest nozzle, located at the most hydraulically remote point of the system,

**Additional Comments:**

**Review Date:** \_\_\_\_\_

**Fire Code Administration Staff Reviewer:** \_\_\_\_\_

