

## **FIRE SERVICE GUIDELINES**

### **The Metropolitan District**

#### General

These guidelines provide supplemental information on fire service limits used for the MDC Availability and Capacity Analysis request (required prior to development or redevelopment of a property) and on design requirements used for the fire service as defined in the MDC Water Service Connection Manual.

New, Changes, or Addition to Sprinkler Systems and Changes in Types – A change in sprinkler type from the existing building (redevelopment of building - changing internal sprinkler system type) may cause a required change in the piping configurations or result in the need for a storage tank. An Availability and Capacity (AC) Request is required.

#### Guidelines

1. Maximum Planned Total Fire Flow – Before considering the fire flow demands that are being requested of the MDC, it should be noted MDC does not guarantee fire flows due to unforeseen issues (e.g., broken water main) that may be occurring at the same instant as a fire event. 1,500-gpm is the maximum total fire flow to be drawn directly from our distribution system. Any required fire flow above this, will require additional onsite storage. Please note the total fire flow allowance may be reduced if the MDC water model indicates significant local pressure fluctuations or when pressures fall below minimum Connecticut Department of Public Health regulated pressures in other areas of the distribution system.
2. 20-psi Pressure Differential (Local Limit) - if the total requested fire flow demand requested causes a pressure drop of more than 20-psi in the nearby distribution system (as predicted by the MDC water model at our Maximum Day Demand), the fire flow will be limited to less than the requested flow.
3. 20-psi Residual Minimum Pressure (System Wide Limit) – if the total fire demand causes system wide pressures to drop less than 20-psi in our water distribution system as predicted by the MDC water model (at our Maximum Day Demand), then the requested fire flow will NOT be approved to be drawn directly from the MDC distribution system, and the flow limit shall be determined based upon system wide compliance.
4. 500-gpm Minimum Hose Flow Rate – if external hose stream is required by the local Fire Marshal/NFPA, a minimum hose stream of 500-gpm will be applied in the model to account for potential connections by a pumper truck to the nearby hydrant.
5. Fire pumps

- a. Fire pumps must NOT draw directly from the MDC water distribution system. They must draw from either a water storage tank (full fire flow storage rated or NFPA approved break tank - subject to MDC and Fire Marshal approval) fed by the MDC distribution system OR from an alternate water source with backflow prevention to safeguard the MDC system. Special attention must be paid to the inlets of the break tanks. Flows above 1,500-gpm and quick opening/closing valves must be avoided.
  - b. If a fire pump is allowed (subject to MDC and Fire Marshal approval) to draw directly from the MDC system due to special circumstances, the system must be protected from potential water hammer caused by pump start up or shut down or pump failure by a NFPA approved surge/bladder tank (subject to the MDC and Fire Marshall approval). Design calculations will be required for submission to the MDC to review sizing/design of the surge/bladder tank. In cases where the NFPA required test (150% of the designed pump demand operating point) exceeds 1,500-gpm (or a lower approved flow - based on parameters discussed earlier), a placard (per NFPA requirements) shall be placed in the pump room to limit testing to 100% design capacity of the pump or will NOT be allowed per the MDC. (NFPA 20, Revision 2010, Section 4.6.2.3.2).
6. Early Suppression Fire Response (ESFR), Dry Type and Deluge Sprinkler Systems – These systems shall require analysis for potential of water hammer and the need for protection to be provided to the MDC distribution system, via a surge/bladder tank unless connected via a water storage tank and fire pump combination.
7. Fire Connection Size Limit
- a. No fire service connection shall be larger than 8-inches.
  - b. The service line to the water storage tank may be reduced in size to limit the filling rate of the tank.
8. Storage Tanks
- a. Fill valves must be capable of being adjusted for slow closing and slow opening operation to prevent water hammer if connected to the MDC system.
  - b. An air gap shall be provided in the fill line of the tank.
9. Break Tanks
- a. A multiple header inlet shall be designed to not allow filling to increase beyond the maximum flow allowance approved for the site (up to 1,500-gpm).
  - b. Soft open/closing valves are required for the inlet header.


10. Surge Tanks/Bladder Tank

- a. Surge tanks shall be sized to prevent a down surge on the MDC system of not more than 20-psi from normal pressure (locally) and a system wide pressure drop below 20-psi.
- b. Surge tanks to be sized to prevent an up surge on the MDC system of not more than 20-psi from normal operating pressures (locally) and/or above the local water main pipe rating.
- c. Dry type sprinkler sizing may be different than tank sizing for wet/ESFR, deluge, and pumped system requirements. The surge tank size, at a minimum, shall be required to fill the empty dry pipes volume.
- d. Deluge sprinklers may require a larger tanks as well since these systems discharge into near atmospheric pressures and must also be sized to contain the volume of the empty sprinkler pipes.

11. Valves - gate valves are to be used where possible instead of butterfly valves on the sprinkler systems (to help prevent water hammer)

- a. NOTE: Sometimes the initial fill of a wet type system is problematic if it is a large system – operators must be cautious and fill very slowly.

12. Fire Marshal Signature on Drawings – We request the local Fire Marshal sign the drawings indicating acknowledgement of the total fire flow demand as well as the hydrant layout/fire service size into the building. An example of a signature box is below:

FOR FIRE FLOW REQUIREMENTS & PRIVATE HYDRANT APPROVAL	
<p>1. THE FIRE MARSHAL AND DEVELOPER CONCUR THERE IS A 1,500-GPM FIRE FLOW DEMAND REQUIREMENT.</p> <p>2. THE FIRE PUMP SHALL NOT BE TESTED OVER 1,500-GPM.</p> <p>3. PER THE NFPA 13, A PLACARD IS TO BE PLACED AND AFFIXED INSIDE THE PUMP ROOM STATING "PUMP SHALL NOT BE TESTED OVER 1,500-GPM PER WATER SUPPLIER SYSTEM (MDC)".</p> <p>4. ALTHOUGH FIRE FLOW SUPPLY OF 1,500-GPM IS NOT GUARANTEED PER WATER SUPPLY ORDINANCES (MDC), FIRE FLOW DEMAND IS ALLOWED UP TO 1,500-GPM ONLY PER WATER SUPPLIER (MDC), AS AGREED BETWEEN DEVELOPER AND FIRE MARSHAL.</p> <p>5. PRIVATE HYDRANT LOCATIONS APPROVED AS SHOWN HEREON.</p>	
 _____ FIRE MARSHAL	<p style="text-align: center;">8/11/16</p> _____ DATE

13. Backflow prevention devices are required on all fire systems. Please contact MDC Utility Services for information on devices.