

**UNIVERSITY OF ROCHESTER
ENVIRONMENTAL HEALTH & SAFETY**

Policy No.: FS015	Approved by: Mark Cavanaugh
Title: Annual Fire Pump Testing Procedure	Date: 10/10/2022
Revision No.: 4	Page 1 of 4
Prepared by: Mark Militello	
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I. PURPOSE

This procedure establishes guidelines for the annual testing of all fire pumps in buildings within the University of Rochester by representatives of the University Fire Marshal's Office. This procedure is based on NFPA 25 Standard for the Inspection, Testing and Maintenance of Water-Based Fire Protection Systems, Chapter Eight.

II. PERSONNEL AFFECTED

Fire Safety Specialist and Fire Safety Inspectors from the Office of Environmental Health and Safety, Fire Safety Unit.

III. DEFINITIONS

FSS Fire Safety Specialist
FSI Fire Safety Inspector

IV. RESPONSIBILITIES

- A. The FSS or FSI is responsible for the annual flow testing of all fire pumps in buildings within their area of responsibility. Upon identification of any deficiencies it is the responsibility of the FSS and FSI to issue work orders and work with the appropriate personnel to see that repairs and or replacements are made and completed to all deficient materials.
- B. The landlord is responsible for the annual flow testing of all fire pumps in buildings not owned by the University. Upon identification of any deficiencies it is the responsibility of the landlord to correct all deficiencies.

V. PROCEDURES

- A. The annual test shall be conducted under churn, 100% of pump rating, and 150% of pump rating of the fire pump by controlling the quantity of water discharged through approved test devices. If available suction supplies do not allow flowing of 150 percent of the rated pump capacity, the fire pump shall be permitted to operate at maximum allowable discharge without having the suction pressure reduce to less than 20psi. Weekly/monthly inspection checklists should also be followed during the annual testing.
- B. Use Hose Monsters to help disperse the water and increase safety.
- C. Pump suction and discharge pressures and the flow measurements of each hose stream shall be determine the total pump output. Care shall be taken to prevent water damage by verifying there is adequate drainage for the water discharge from hoses.
- D. The pertinent visual observations, measurements, adjustments and documentation specified in the following checklists shall be conducted while performing the fire pump test under the specified condition.
 - a. Pretest inspection/preparations

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- (1) Check for A/C power at pump controller.
 - (2) For diesel fire pumps, make sure fuel level is adequate and not below 3/4 full.
 - (3) Change out current gauges on suction and discharge with calibrated liquid filled gauges.
 - (4) Verify alignment of all valves in sprinkler room are in correct positions.
 - (5) Make sure test header drain is **closed**.
 - (6) Record static pressure of suction and discharge with fire pump off.
- b. No-flow condition (churn) test:**
- (1) Follow same procedure as the weekly/monthly fire pump test procedure.
 - (2) Check circulation relief valve for operation to discharge water.
 - (3) Check the pressure relief valve (if installed) for proper operation.
 - (4) Check for proper water displacement off fire pump packings.
 - (5) Record suction and discharge pressures
 - (6) Record amps and volts if digital readings are available on the pump controller or by shark meter.
 - (7) Record RPM readings
- c. 100% of rated flow test:**
- (1) Open test header **main** isolation valve **SLOWLY** until the test header is full.
 - (2) Manipulate the test header valves until the pitot readings at the hose monsters have achieved the desired flow for 100% of fire pump rating. (Refer to pump test sheets for desired psi)
 - (3) Take your amp and volt readings from the digital output on the fire pump controller or from the installed shark meter.
 - (4) Record RPM readings.
 - (5) Record the simultaneous (approximately) readings of pump suction pressure, discharge pressure and hose stream pitot readings.
 - (6) Monitor pump packaging temperature.
- d. 150% of rated flow test:**
- (1) Manipulate the test header valves until the pitot readings at the hose monsters have achieved the desired flow or as close as possible to achieve 150% of fire pump rating. (Refer to pump test sheets for desired psi)
 - (2) Take your amp and volt readings from the digital output on the fire pump controller or from the installed shark meter.
 - (3) Record RPM readings.
 - (4) Record the simultaneous (approximately) readings of pump suction pressure, discharge pressure and hose stream pitot readings.
 - (5) Monitor pump packaging temperature.
- e. Water supply test**
- (1) Shut down the fire pump at the controller.
 - (2) Shut down the jockey pump.

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- (3) Open all test header valves to the full open position.
 - (4) Record pitot readings at each test header outlet.
 - (5) Record pump suction and discharger pressures.
- f. Realignment**
- (1) After all readings have been completed close test header valves
 - (2) Close test header **main** isolation valve.
 - (3) Open test header drain line.
 - (4) Open test header valves to support draining of test header.
 - (5) Once test header is drained, close test header valves.
 - (6) Close test header drain line.
 - (7) Cap test header ports.
 - (8) Verify valves of the fire pump are back in normal operating positions.
 - (9) Turn jockey pump on to bring system up to desired pressure.
 - (10) Once system up to desired pressure, turn main pump on.
 - (11) Verify main power has been restored to fire pump.

All information obtained will be returned to the University Fire Marshal for further calculation and graphing of the fire pump test results.

VI. REFERENCES

NFPA 25 Standard for Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems.

VII. APPENDICES/FORMS

Appendix I - Fire Pump Test Sheet – Blank Form

VIII. REVISION HISTORY

Date	Revision No.	Description
3/20/2009	New	Annual Fire Pump Testing Procedure
10/27/2011	1	Added clarity to the procedure for pretesting and more specific steps for each test
6/21/2016	2	Updated procedure
6/4/2019	3	Updated procedure
10/10/2022	4	Triannual review – Clarified where to obtain desired psi numbers for 100% and 150% tests

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Appendix I

Annual Fire Pump Performance Test

Date _____		Inspectors <u>UR Fire Marshals Office</u>					
Building _____		Location _____					
Make _____		Capacity _____ GPM @ _____ PSI					
		Pump Off Static	Pump On Static	Flow Test #1	Flow Test #2	Flow Test #3	City Flow No Pump
Number of test header ports used							
Length of each hose line (50' lines)							
Hose diameter				3"	3"		3"
Nozzle size				1 3/4"	1 3/4"		1 3/4"
Pump suction pressure							
Pump discharge pressure							
Net pump pressure							
Hydrant pressure							
Pitot pressure (taken from Hose Monster) Using 1 3/4" insert							
Flow meter reading							
Calculated GPM							
			L1				
			L2				
			L3				
			L1				
			L2				
			L3				
Fire pump kick ON pressure			PSI	Fire pump kick OFF pressure			PSI
Jockey pump kick ON pressure			PSI	Jockey pump kick OFF pressure			PSI
Timer operates properly		YES		Pump run timer shutoff			Minutes
Overheating OK		YES	NO	Vibration OK		YES	NO
Pressure drop start OK		YES	NO	Automatic start OK		YES	NO
Manual start OK			NO	Bearings OK		YES	NO
Transfer to emergency power during peak load OK			YES	NO			
Transfer back to normal power during peak load OK			YES	NO			
Lines taken from:							
NOTES:							
COMMENTS:							