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Test Report on the Performance Evaluation of Sprinkler Heads in a Full Scale Room Construction: Modified AC 171

Conducted For:

**New Mat
25 Surryhill Place
Huntington, NY 11743**

WFCi Report #04025

Conducted On: April 3, 2004

Report Issued On: April 7, 2004

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INTRODUCTION

This report documents the evaluation of sprinkler performance in a full scale room construction (modified AC 171) performed by Western Fire Center, Inc. (WFCi) for:

**New Mat
25 Surryhill Place
Huntington, NY 11743**

Logan Byman, Wayne Beres and Tony Mansur of WFCi conducted the test under the supervision of Mike White (WFCi) on April 3, 2004.

This test was witnessed by Pascal Gicquel and Kenneth Merk of New Mat and James White and Howard Stacy of WFCi.

The purpose of this test was to evaluate the performance of a stretch ceiling sample in a 15' X 15' X 18' room construction when a standard 1ft² ceramic burner heats the room, and to assess the performance of sprinkler heads in relation to the ceiling material.

Data from the test can be found in Appendix A. Photographs from the test can be found in Appendix B. Notes and tabular data from the test are in the Test Results section.

Sample Description

The room constructed for the sprinkler evaluation test was a 15' X 15' X 18' wood stud construction. The interior of the construction was covered with 5/8" type X gypsum wallboard.

Two 2' X 2' soffits made of 5/8" type X gypsum were added running along each side wall of the room 11'-6" up from the floor. Sprinkler heads 1, 2, 4 and 5 were attached to pipes that came down from roof of the room and through these soffits, ending up 11'-1.5" above the floor. Sprinkler #1 was located 1.5' in from the left wall and 1' in from the front of the room, #2 was located 1.5' in from the left wall and 1' in from the back wall, #4 was located 1.5' in from the right wall and 1' in from the back wall, #5 was located 1.5' in from the right wall and 1' back from the front of the room. Sprinkler #3 was centered in the room, 7'-6" in from each wall and 4¼" down from the ceiling. These sprinkler heads were all located above the stretch ceiling material during testing. Sprinkler #6 was also centered in the room, 7'-6" in from each wall and 83" down from the ceiling, below the soffits and the stretch ceiling material.

1¼" X 3/8" aluminum track ran around the room 133" above the floor. This tracking was attached to the front and rear walls and below the two soffits that ran along the right and left walls. The tracking was used to install the New Mat (white in color) 15' X 15' stretch ceiling sample for testing.

Six (6) thermocouples were placed in the room structure to record temperature data during the test, each installed at the location of a sprinkler head and with the same numbers listed in the above paragraph.

The heads located at TC #1, #2, #4 and #5 were deactivated during this test. The head located at TC #3 was a 286° quick-response sprinkler and the head located at TC #6 was a quick-response 155° sprinkler.

A standard ceramic 1ft² square burner was placed in the corner of the room, 3'-6" from the left wall and 3'-6" from the back wall. It was set at a Heat Release Rate 160kW for the first 5 minutes of the test and at 250 kW for the remainder of the test.

Temperature data obtained from the thermocouples appears in graphical form in Appendix A of this report and in tabular format in the Test Results section of this report.

Test Results

Observations were recorded in the form of notes taken by WFCi's Tony Mansur, as follows:

TEST NOTES

Test Date: 4/03/2004, 4:50 PM

Test Type: Modified AC 171

Specimen Tested: 15' X 15' X 5 mil. white PVC stretch ceiling
suspended by aluminum track

Ambient Temp/Humidity: 76F/32%

Cameras: 1 digital still camera, 1 video camera

Observations:

Test Time (h:mm:ss)	Event
0:00:00	Light burner, output of burner set at 160kW(HRR)
0:01:00	No change
0:02:00	No change
0:03:00	No change
0:04:00	No change
0:05:00	Increase burner to 250 kW
0:05:14	Sprinkler #6 activated, End Test

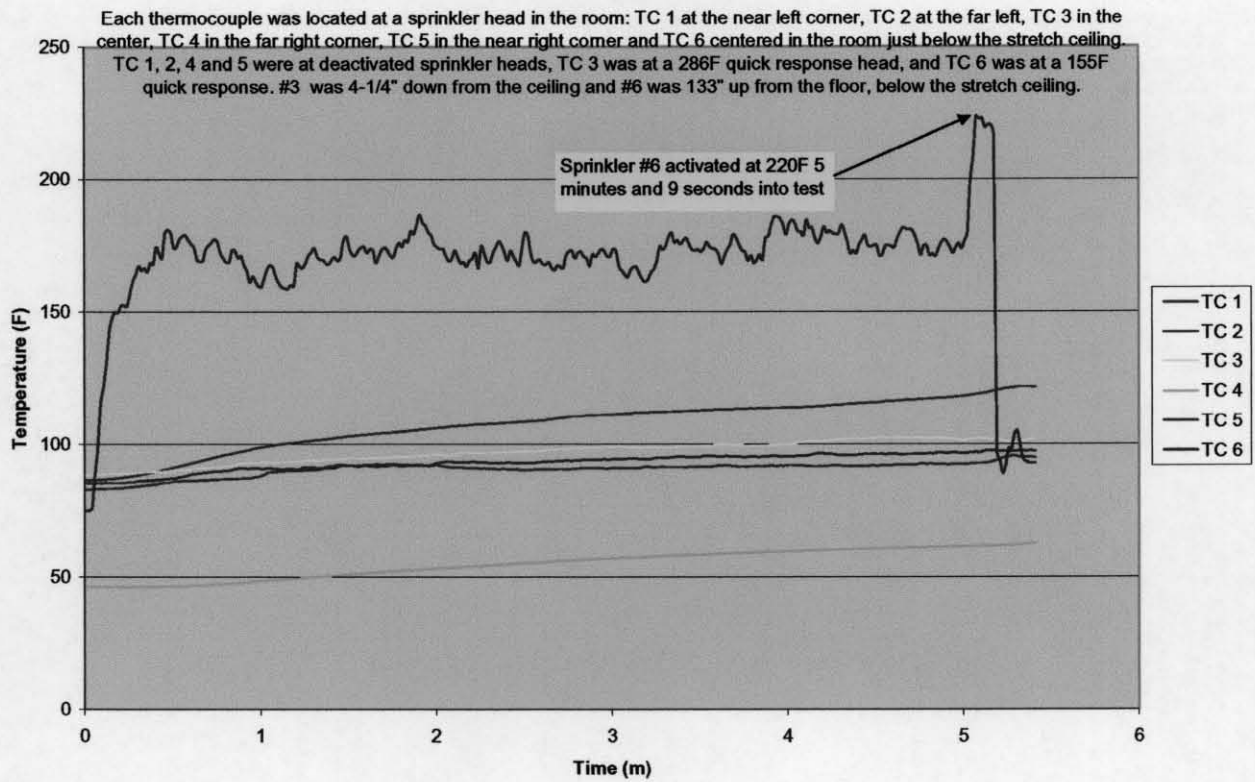
Test Three Thermocouple Temperature Data (Sprinkler at TC6 Activated at 0:05:09)

Time (m)	TC1 (F)	TC2 (F)	TC3 (F)	TC4 (F)	TC5 (F)	TC6 (F)
0	82.9	86.5	88.4	46.4	85.3	74.8
1	88.1	98.9	93.1	48.4	90.8	159.5
2	92.1	106.1	96.2	53.2	93.0	174.4
3	91.0	111.1	99.0	57.0	94.5	173.6
4	92.2	113.7	99.9	59.6	95.3	182.8
5	92.5	118.1	101.7	61.7	96.7	176.6
5:09	93.3	119.7	101.9	61.9	97.6	220.3

APPENDIX A:
CHARTS

New Mat Room Test
04019

New Mat Test Thermocouple Temperatures



APPENDIX B:
PHOTOGRAPHS



Photo 1: Room Being Constructed.



Photo 2: Another Construction Photo of Room.



Photo 3: Room Construction Complete.



Photo 4: Soffit on Left Side of Room: Sprinkler #1 on the Left and #2 on the Right.

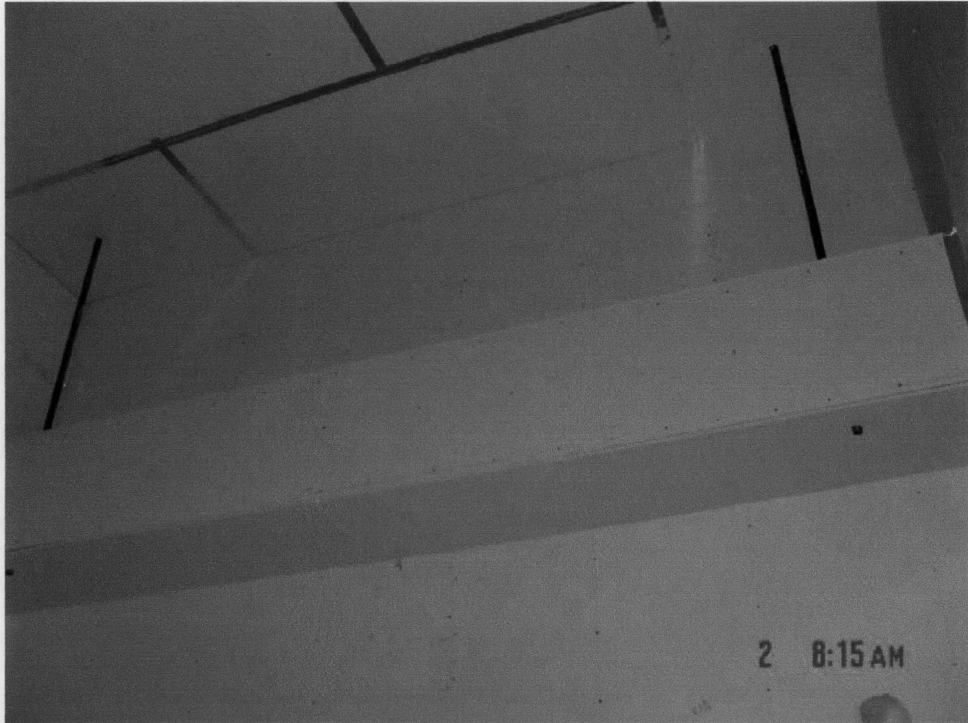


Photo 5: Soffit on Right Side of Room: Sprinkler #4 on the Left and #5 on the Right.



Photo 6: Front View of Room with Soffits Installed.

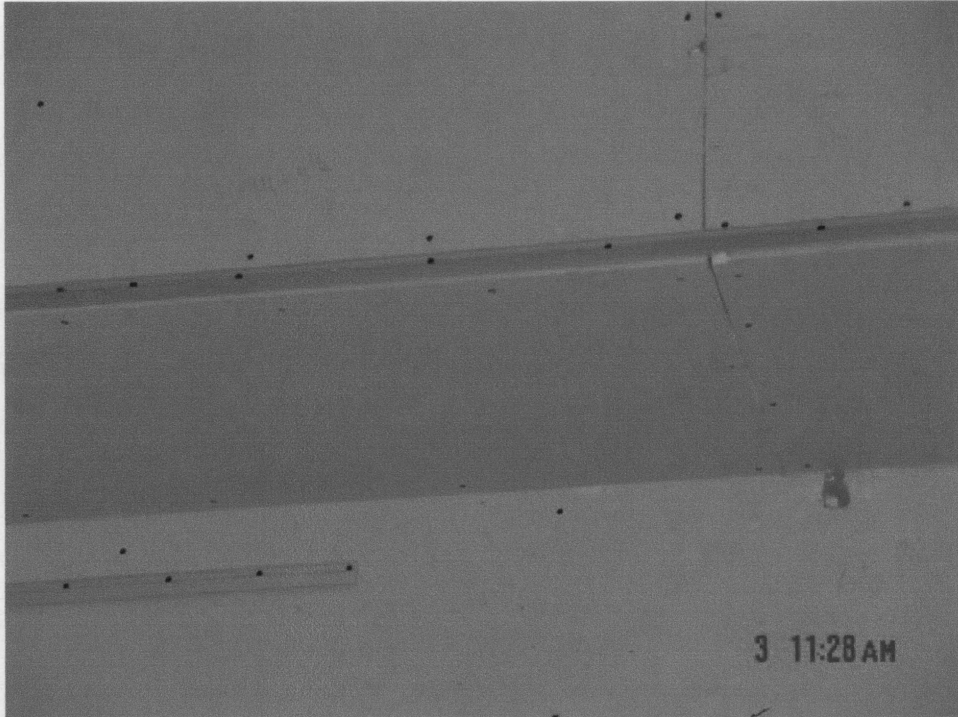


Photo 7: Aluminum Track Running Across Side Wall Below Soffit for Stretch Ceiling Installation.



Photo 8: Installation of Stretch Ceiling Material.



Photo 9: Installation of Stretch Ceiling Material.

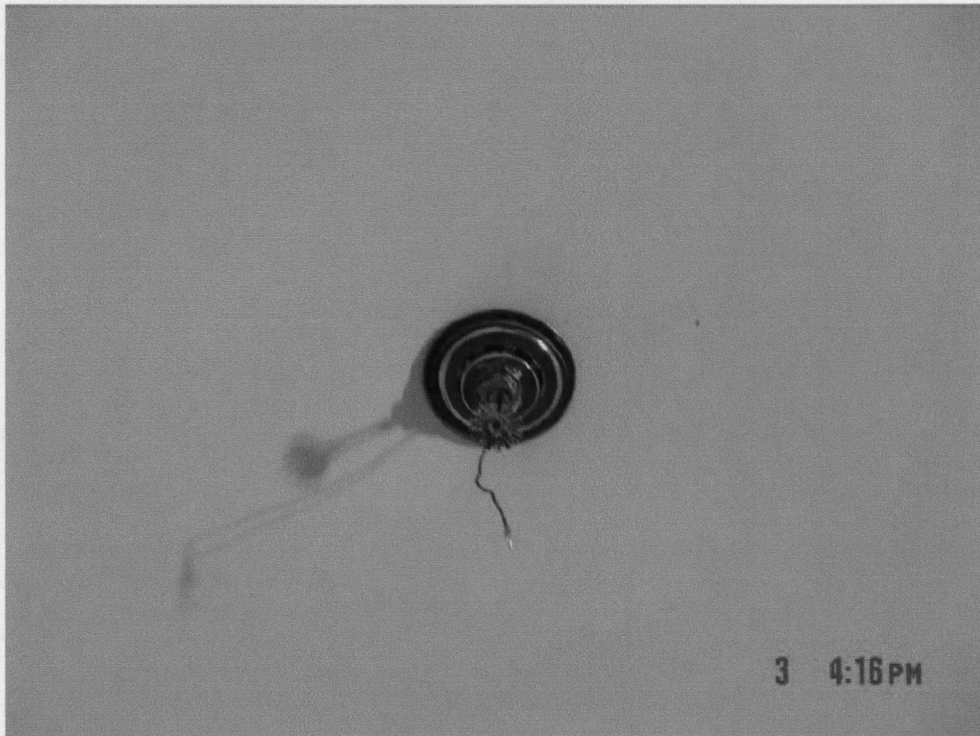


Photo 10: Sprinkler and Thermocouple #6 Coming Through Center of Stretch Ceiling.



Photo 11: Square Burner Placed in Corner for Test.

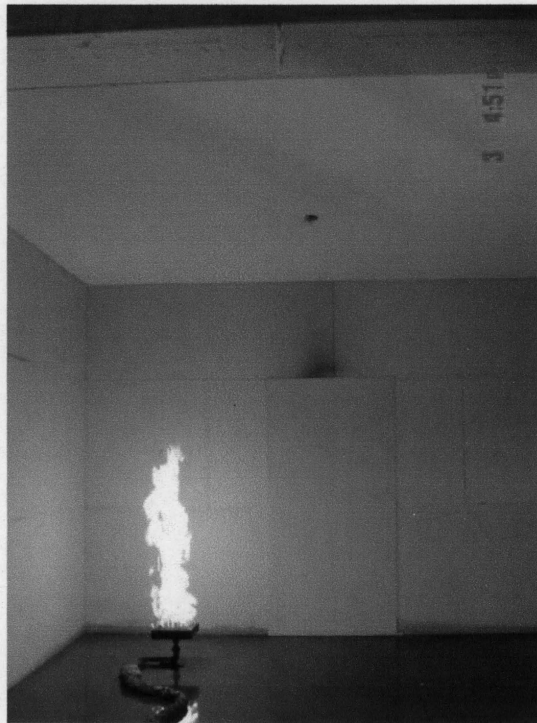


Photo 12: Photo During Test.

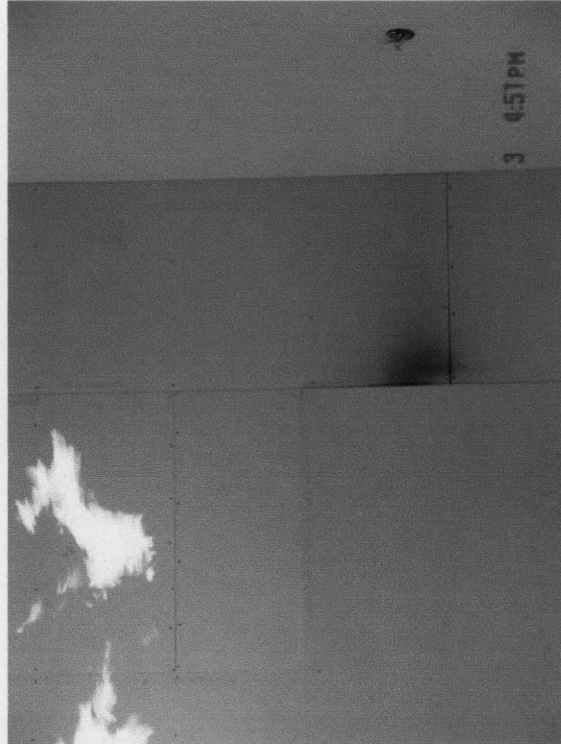


Photo 13: Photo During Test.

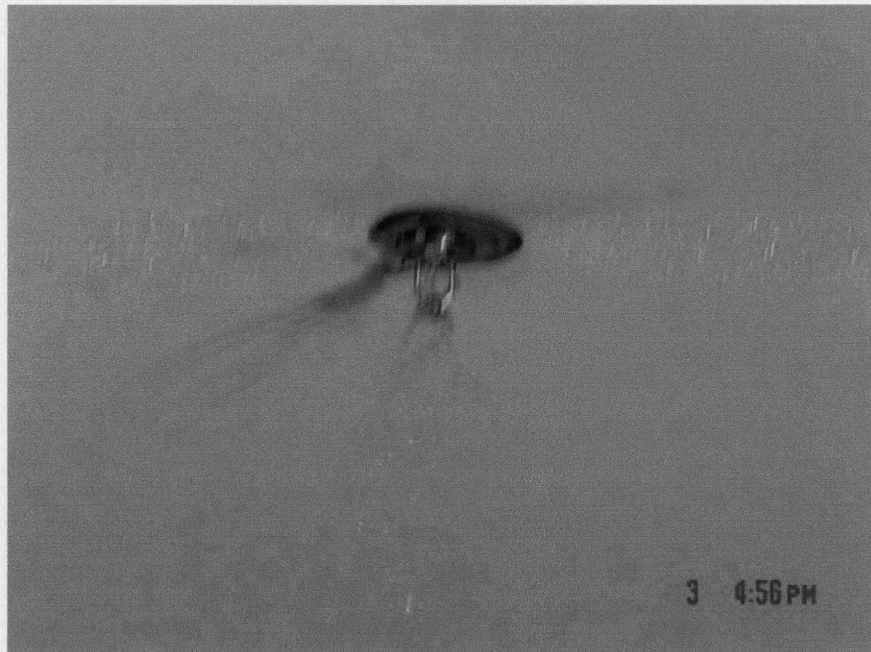


Photo 14: Sprinkler #6 Activated, Ending Test.