

**INFRARED BUILDING ENVELOPE SURVEY**

*for*

*ABC Company  
123 Main Street  
Anytown, USA*

*at*

*ABC Company  
123 Main Street  
Anytown, USA*



# **JERSEY INFRARED CONSULTANTS**

P.O. Box 39  
Burlington, NJ 08016  
Phone: (609) 386-1281  
Fax: (609) 387-4334

(Date)

Mr. Smith  
ABC Company  
123 Main Street  
Anytown, USA

RE: INFRARED BUILDING ENVELOPE SURVEY REPORT  
OUR JOB NUMBER: 16-1234.5

Dear Mr. Smith:

Here is our completed report in hard copy and electronic formats for the Infrared Building Envelope Survey performed at the ABC Company facility located at 123 Main Street in Anytown, USA on (date).

Thank you for this opportunity to serve you. If you have any questions or if we can be of further assistance, please feel free to call.

Very truly yours,

MC  
Level III  
Infraspection Institute Certified Infrared Thermographer

MC:clt  
Enclosure

## INTRODUCTION TO THE INFRARED BUILDING ENVELOPE SURVEY (INTERIOR/EXTERIOR)

Infrared thermography is a form of non-contact, non-destructive testing used to detect and document thermal patterns and associated temperatures across a given surface. Infrared thermography can be used as a quality assurance and/or diagnostic tool to find latent failures or defects within the building envelope.

Two types of energy loss can occur within a building envelope. The first type of loss is conduction. Conduction losses are most often due to missing or damaged insulation within the building walls and/or roof. Conduction heat losses may also be caused due to entrapped moisture within the building sidewalls. The second type of heat loss is air infiltration/exfiltration. Air infiltration/exfiltration can occur at numerous locations within a building envelope through seemingly insignificant cracks and uncaulked openings. Air infiltration can be detected when Surveys are performed from the interior of the building. Air exfiltration can be detected when Surveys are performed from the exterior of the building.

Our Infrared Surveys are performed by Certified Thermographers using a portable thermal imaging system called FLIR ThermaCAM. This equipment detects infrared energy emitted from an object and converts it into an image which is displayed on a monitor screen.

Because infrared energy is a direct and proportional function of temperature, the displayed image is designed to depict temperature levels on the monitor in either black and white or color. In the black and white mode, the thermal image looks very similar to a black and white television picture where the various shades of gray represent different temperature levels throughout the chosen temperature range. Black corresponds to a lower temperature, and white indicates a higher temperature. In the color mode, colors are matched to the reference temperature bar at the side of the Thermogram. Colors which appear closer to the top of the reference bar correspond to higher temperatures. Colors appearing closer to the bottom of the reference bar correspond to lower temperatures.

Our FLIR equipment has the capability to sense object temperatures from  $-10^{\circ}$  Celsius to  $+1500^{\circ}$  Celsius, with sensitivity of as little as 0.07 Celsius degrees.

When viewed through the infrared imager, air infiltration/exfiltration generally appear as amorphous thermal signatures appearing around windows, doors and other penetrations or openings in the building envelope. Conduction heat losses generally appear as amorphous or square edge patterns throughout the building envelope.

Once the location of a problem area has been noted, the thermal image displayed on the FLIR monitor is recorded to electronic media. Thermograms are then made from the stored images and incorporated into our report, along with a description of the problem area.

(Date)

Mr. Smith  
ABC Company  
123 Main Street  
Anytown, USA

THERMOGRAPHER'S COMMENTS  
OUR JOB NUMBER: 16-1234.5

On (date), an Infrared Building Envelope Survey was performed at the ABC Company facility located at 123 Main Street, Anytown, USA.

The Survey covered the exterior walls, windows, and doors of the buildings listed below. The Survey was conducted from the exterior of the subject buildings in an attempt to locate latent moisture. The Survey was conducted with the buildings under natural conditions.

The Survey was performed by an Infrasppection Institute Certified Infrared Thermographer using a ThermaCAM S65HS, Thermal Imaging System, Serial #25301069.

Included in this report are Thermograms of several thermal anomalies.

WEATHER CONDITIONS: (Date), daytime skies were sunny with highs in the mid 30's. Evening skies were cloudy with lows in the mid 20's. Winds were calm at 0 to 5 miles per hour.

The latest precipitation prior to the start of our Survey occurred on (date).

FINDINGS: All thermal data collected during our Survey were stored on PC card. Thermograms were then made from the PC card and appear on the following pages along with a brief description of problem areas.

Warm thermal anomalies consistent with latent moisture are shown in Area/Picture Nos. 1, 4, 7, and 14. All of these areas are located in EIFS sections of building walls.

Warm thermal anomalies consistent with missing or damaged insulation are shown in Area/Picture Nos. 8 and 9. A warm thermal anomaly consistent with air exfiltration is shown in Area/Picture 15. Area/Picture Nos. 8, 9, and 15 are located within sided portions of building sidewalls.

Warm thermal anomalies were detected at three separate locations in building soffits and are shown in Area/Picture Nos. 2, 10, and 11. These thermal anomalies may be due to HVAC duct leaks or the presence of animal pests.

Page 2

The entranceway roof for Units 24201 and 24101 appeared much warmer than any other roof within the facility. This thermal pattern is consistent with warm air entering the unoccupied space that is located beneath the entranceway roof deck.

Area/Picture Nos. 3, 5, 6, 12, 13, 16, and 17 depict normal thermal patterns and are included for reference purposes.

RECOMMENDATIONS: We recommend that the cause of all thermal anomalies be investigated and that the proper corrective measures be taken. A follow-up Survey should then be performed once repairs have been made.

Please note that all inspections are performed with the building in an "as found" condition. No attempt is made to verify that the building is under normal operating condition at the time of the Infrared Survey.

This report depicts thermal patterns in the building envelope at the time of the Infrared Survey. No information regarding the structural integrity of the building or the building components is provided or implied in this report.

MC  
Level III  
Infraspection Institute Certified Infrared Thermographer

MC:clt

Area/Picture No. 15 Job No. 16-1442.11 Date 3/3/16

Location Building 21000, West Elevation

Equipment Exterior Wall, Right of Balcony

Wind Speed N/A Wind From N/A Sky Cloudy

Emiss. 1.00 B/G N/A° Distance 25' Lens 1x

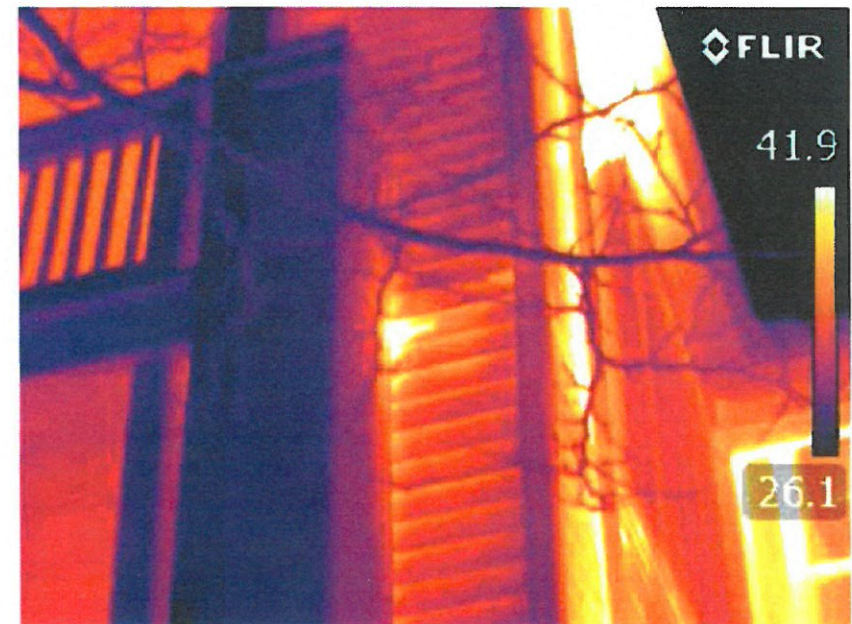
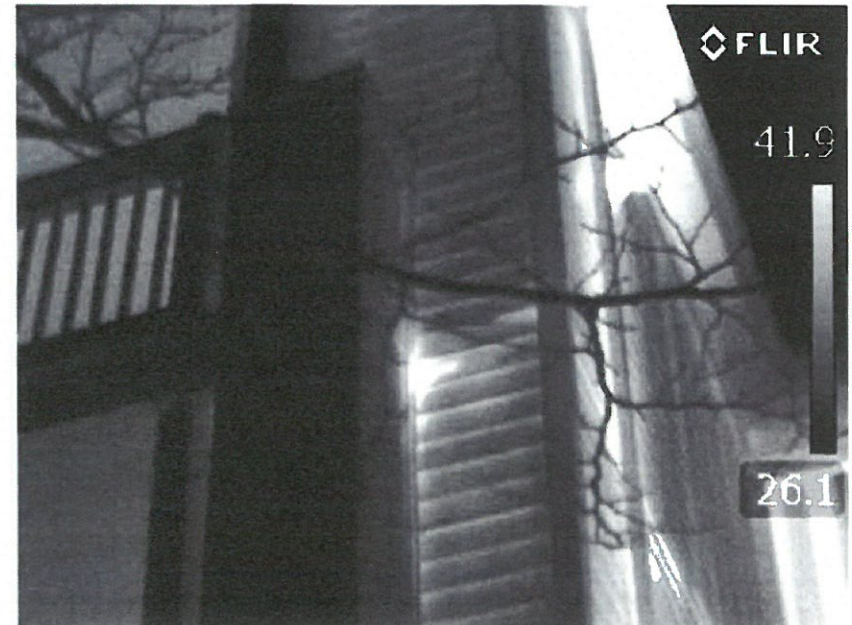
Ambient Temp 34°F

Comments Thermogram shows warm anomaly (white) at the seam to the right of 3rd floor balcony.

Priority

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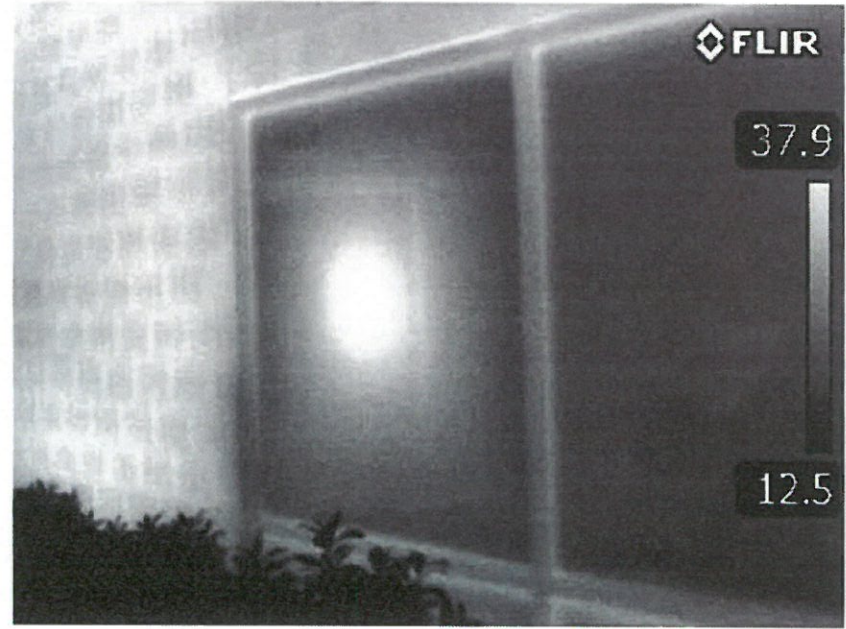
Repair Check Date



Area/Picture No. 26 Job No. 14-3062.1A Date 1/8/15  
Location Child Care  
Equipment Section F, Left Window  
Wind Speed N/A Wind From N/A Sky Partly Cloudy  
Emiss. 1.00 B/G N/A° Distance 30' Lens 1x  
Ambient Temp 17°F  
Comments Thermogram shows thermal pattern typical of failed IGU for left window.

Priority  
Repair Check Date

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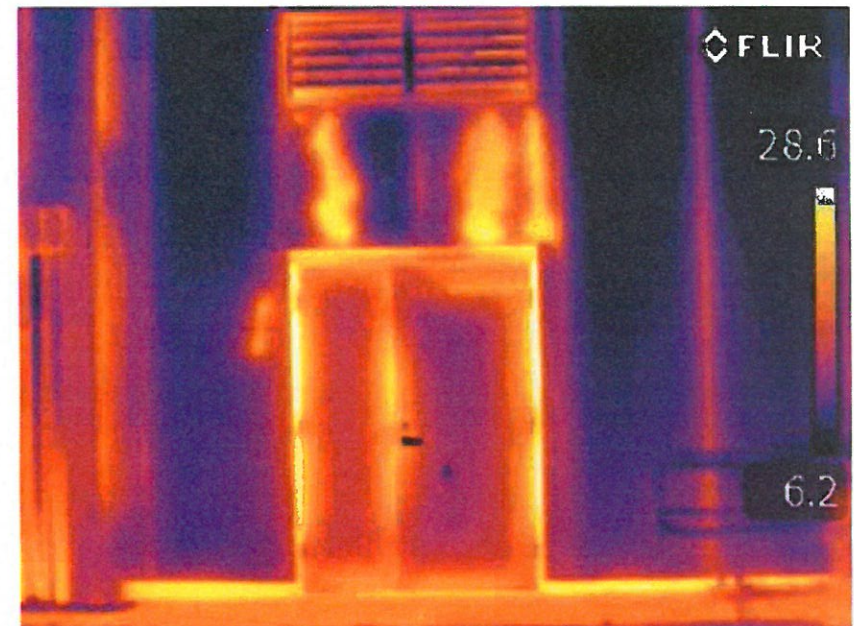
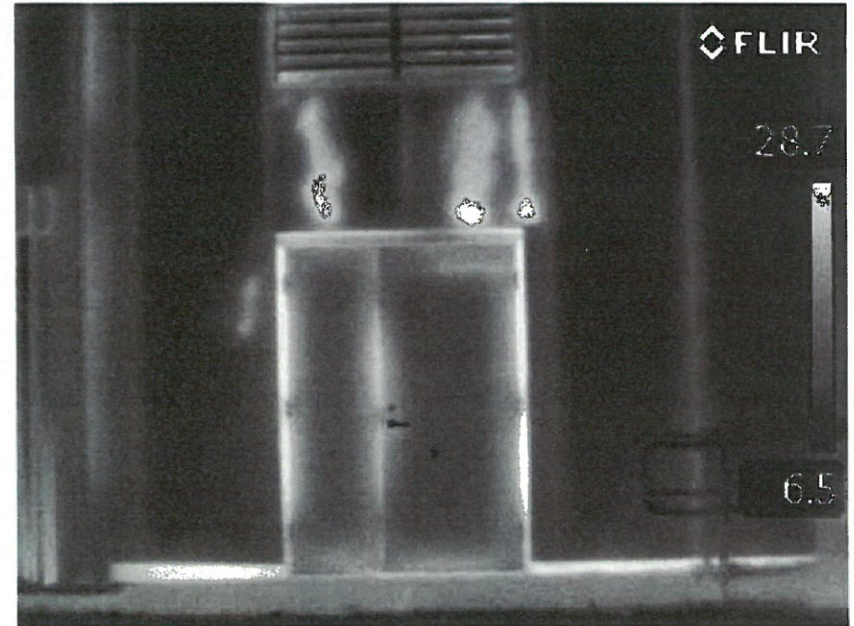
**Area/Picture No.** 14    **Job No.** 14-3062.1A    **Date** 1/8/15  
**Location** Materials, Handling Building  
**Equipment** South Elevation, Middle Door  
**Wind Speed** N/A    **Wind From** N/A    **Sky** Partly Cloudy  
**Emiss.** 1.00    **B/G** N/A°    **Distance** 50'    **Lens** 1x  
**Ambient Temp** 17°F

**Comments** Thermogram shows middle door with energy loss around door. Also, possible moisture above the door.

**Priority**

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**Repair Check Date**





Area/Picture No. 4 Job No. 16-1442.11 Date 3/3/16

Location Building 19000, West Elevation, 1st Floor

Equipment Exterior Wall, Units 19203 and 19204

Wind Speed N/A Wind From N/A Sky Cloudy

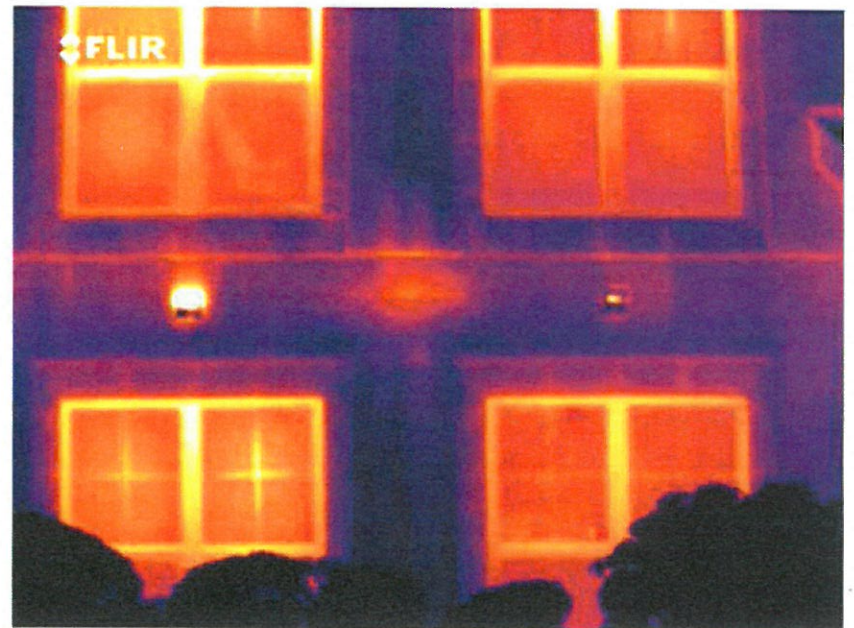
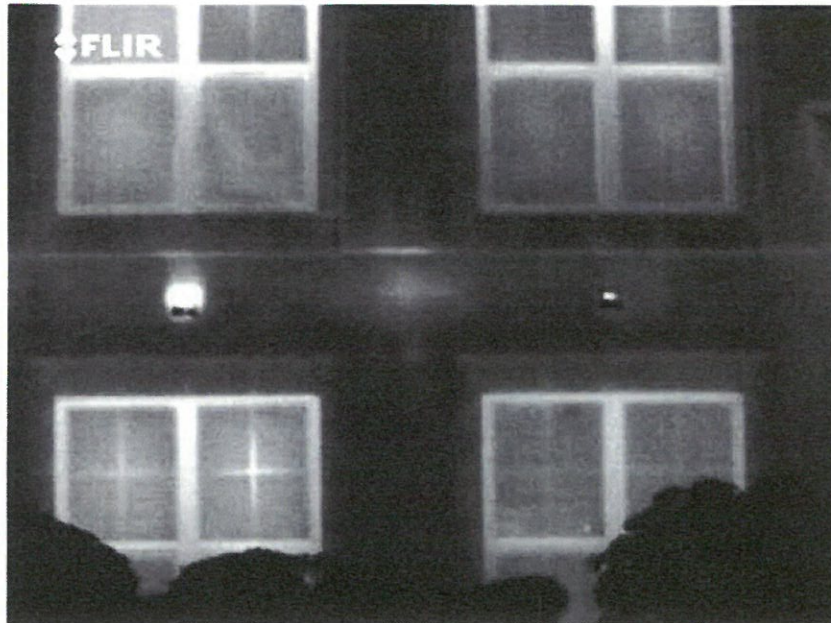
Emiss. 1.00 B/G N/A° Distance 20' Lens 1x

Ambient Temp 35°F

Comments Thermogram shows warm area (orange) above and between 1st floor windows.

Priority

Repair Check Date



Area/Picture No. 2 Job No. 16-1442.11 Date 3/3/16

Location Building 26000, North Elevation, 1st floor

Equipment Exterior Wall

Wind Speed N/A Wind From N/A Sky Cloudy

Emiss. 1.00 B/G N/A° Distance 15' Lens

Ambient Temp 35°F

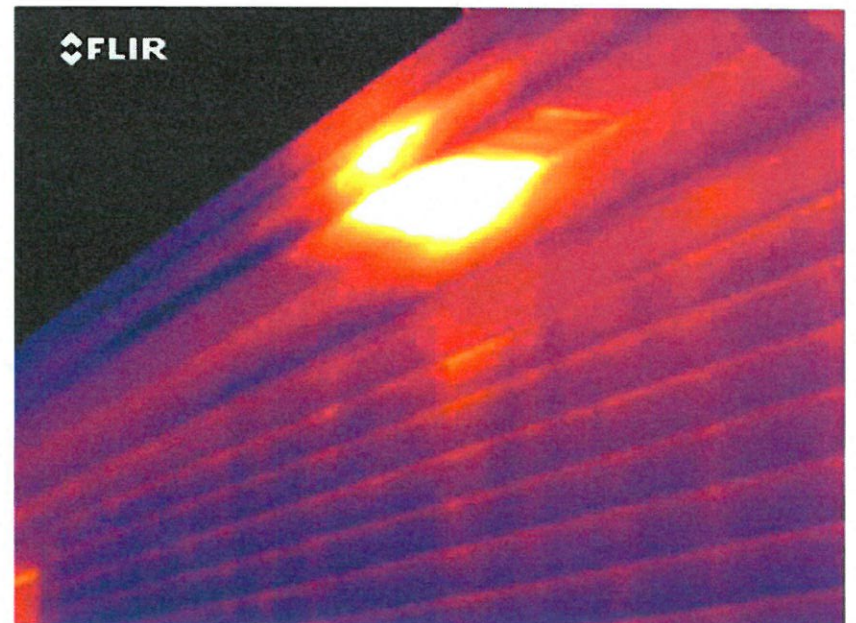
Comments Thermogram shows warm thermal pattern (white) in the soffit area approximately 8 ft. from right corner of building.

White area is approximately 34°F warmer than the adjacent area.

Priority

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Repair Check Date



Area/Picture No. 16 Job No. 16-3161.1 Date 3/17/16

Location Outside, Rear, 1st Floor, Right Section

Equipment Exterior Walls

Wind Speed <5 mph Wind From Northwest Sky Cloudy

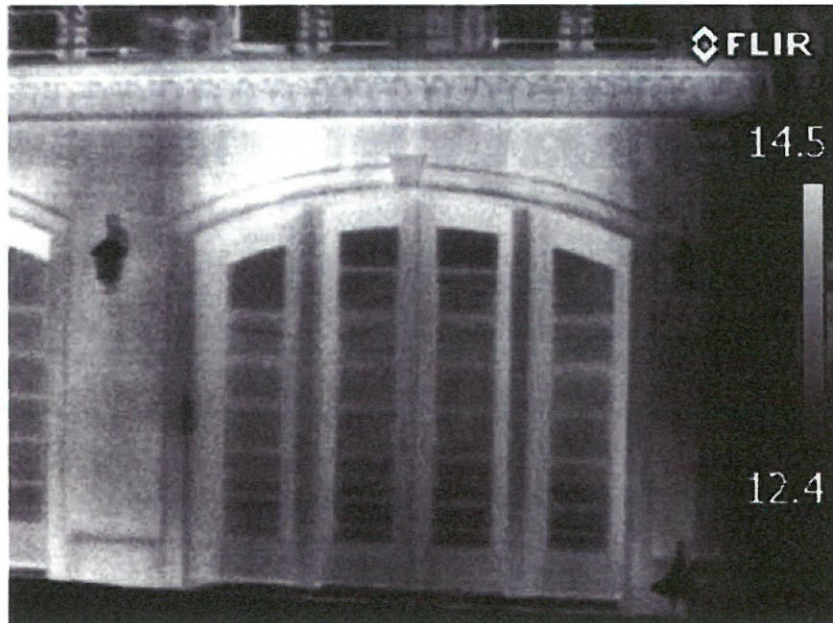
Emiss. 1.00 B/G N/A° Distance 50' Lens 1x

Ambient Temp 57°F

Comments Thermogram shows warm thermal pattern typical of subsurface moisture above and around right doors.

Priority

Repair Check Date



Area/Picture No. 5 Job No. 16-3149.2 Date 3/17/16

Location South Elevation

Equipment Exterior Wall

Wind Speed 10-15 mph Wind From West Sky Cloudy

Emiss. 1.00 B/G N/A° Distance 100' Lens 1x

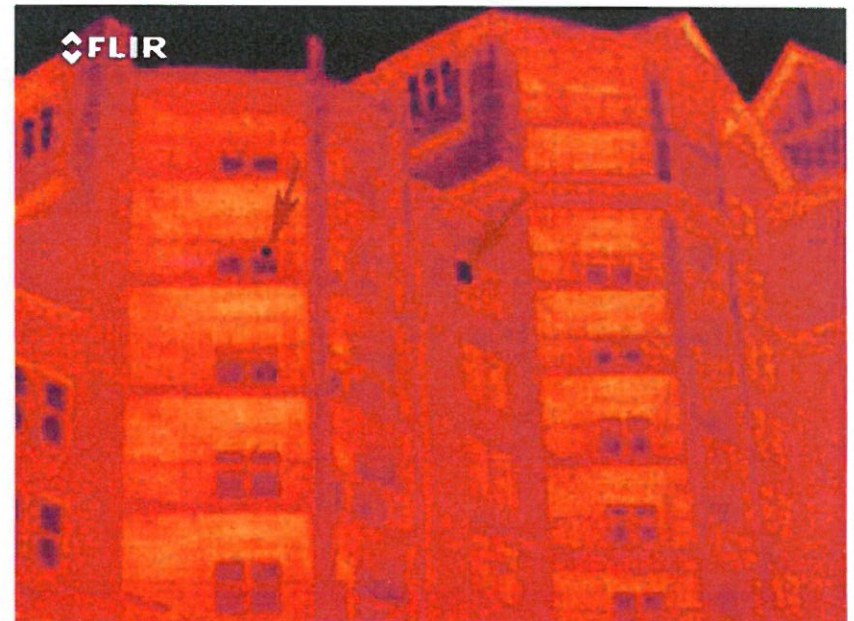
Ambient Temp 59°F

Comments Thermogram exhibits black spots on two windows. Possible lost seals. Balance of walls and windows exhibit normal thermal pattern.

Priority

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Repair Check Date



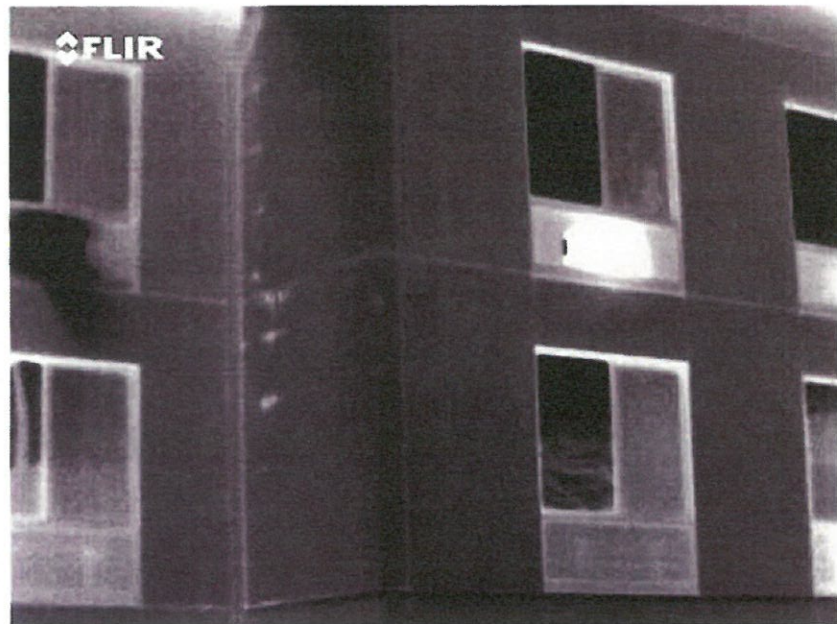
**Area/Picture No.** 10    **Job No.** 16-2962.6    **Date** 5/9/16  
**Location** North Elevation  
**Equipment** Exterior Wall, Rooms 207 and 307  
**Wind Speed** 5 mph    **Wind From** West    **Sky** Partly Cloudy  
**Emiss.** 1.00    **B/G** N/A°    **Distance** 50'    **Lens** 1x  
**Ambient Temp** 58°F

**Comments** Thermogram shows thermal anomalies typical of latent moisture in East wall of Rooms 207 and 307.

**Priority**

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**Repair Check Date**



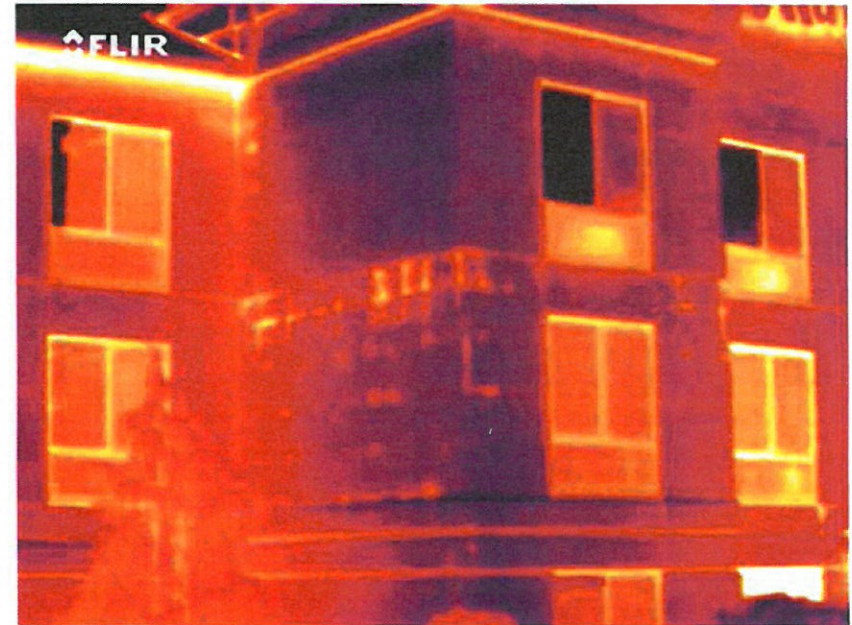
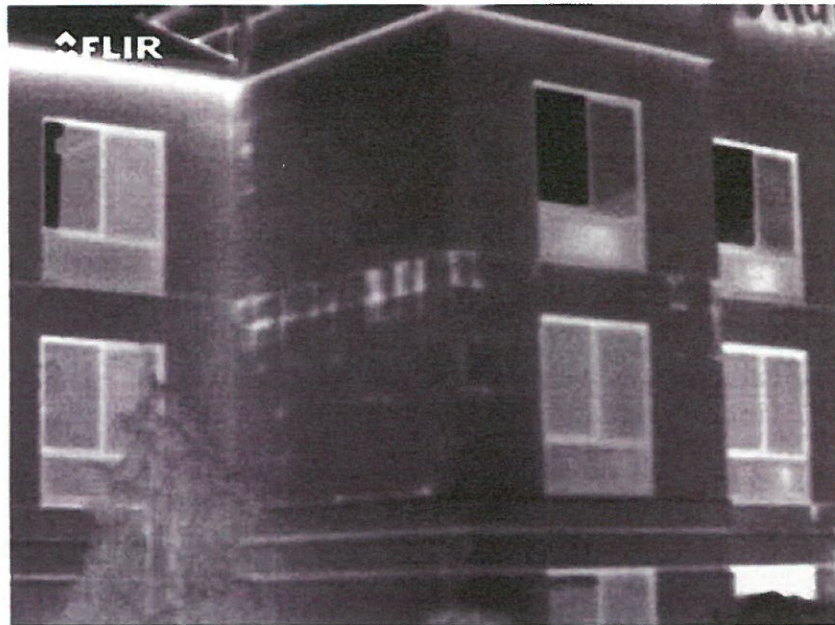
Area/Picture No. 8 Job No. 16-2962.6 Date 5/9/16  
Location North Elevation  
Equipment Exterior Wall, Front Desk, Rooms. 217 & 317  
Wind Speed 5 mph Wind From West Sky Partly Cloudy  
Emiss. 1.00 B/G N/A° Distance 75' Lens 1x  
Ambient Temp 58°F

Comments Thermogram shows thermal anomalies typical of latent moisture in the North and East walls for Rooms 217 and 317.

Priority

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Repair Check Date



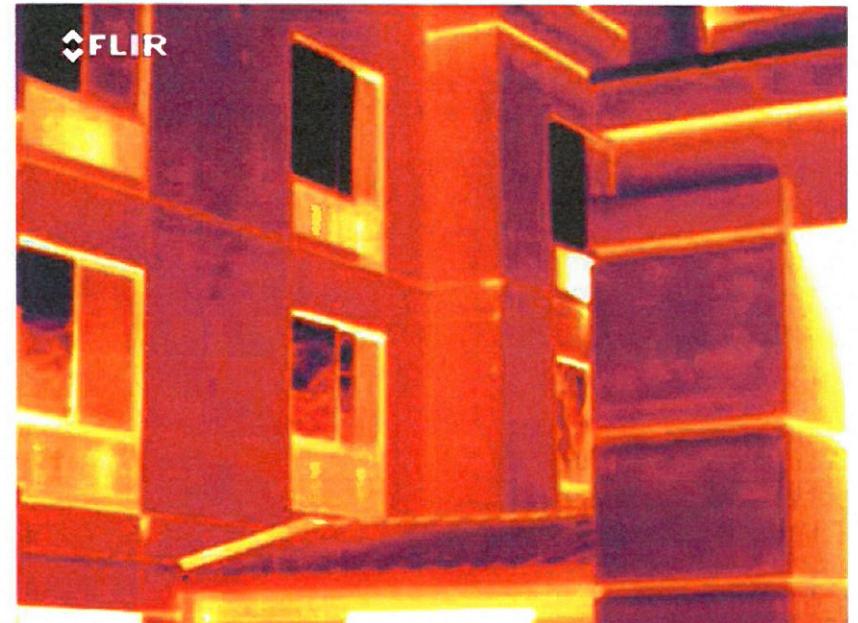
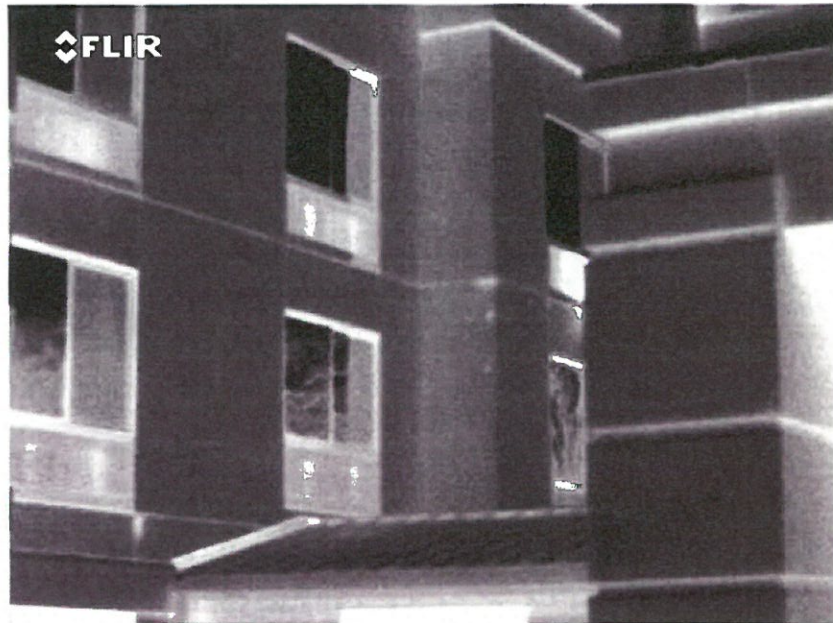
**Area/Picture No.** 7    **Job No.** 16-2962.6    **Date** 5/9/16  
**Location** North Elevation  
**Equipment** Exterior Wall, Rooms 223 and 219  
**Wind Speed** 5 mph    **Wind From** West    **Sky** Partly Cloudy  
**Emiss.** 1.00    **B/G** N/A°    **Distance** 50'    **Lens** 1x  
**Ambient Temp** 58°F

**Comments** Thermogram shows thermal anomalies typical of latent moisture in East Wall of Room 223 and at lower right corner of window for Room 219.

**Priority**

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**Repair Check Date**



**Area/Picture No.** 6      **Job No.** 16-2962.6      **Date** 5/9/16  
**Location** North Elevation  
**Equipment** Exterior Wall, Room 217  
**Wind Speed** 5 mph      **Wind From** West      **Sky** Partly Cloudy  
**Emiss.** 1.00      **B/G** N/A°      **Distance** 70'      **Lens** 1x  
**Ambient Temp** 58°F

**Comments** Thermogram shows thermal anomalies typical of latent moisture for West and North walls of Room 217.

**Priority**

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**Repair Check Date**

