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659B Lakeview Plaza Blvd. • Worthington, OH 43085 • (614)885-3319 • FAX (614)885-4269

October 14, 2019

Mr. Chris DeLuca  
CT Consultants, Inc.  
8150 Sterling Ct  
Mentor, OH 44060

SUBJECT: Thermographic Roof Survey of Liberty Township Administration Building

Chris:

The enclosed report concludes the Thermographic Roof Survey as requested on the above building

The Infrared Survey was performed using an AGEMA 550 Thermovision System on the evening of October 13, 2019. The weather during the day was sunny with temperatures in the upper 60's. The evening was clear with temperatures in the low 60's.

We found one large area of wet insulation during the survey. The perimeter of the wet area is marked on the roof surface with green spray paint and numbered accordingly.

I want to take this opportunity to thank you for using us for this project and if you have any further questions, please feel free to call.

Cordially,  
PEMCo Thermal, Inc.

A handwritten signature in black ink, appearing to read 'Tom Martin'.

Thomas Martin  
President

## **THERMOGRAPHIC EXAMINATION**

### **A. BACKGROUND**

With the advent of thermography, roofs can be scanned with a highly sophisticated infrared camera to detect and accurately map subsurface moisture, thereby determining whether a portion or all of the roof requires replacement. Unlike other non-destructive techniques, thermal scanning assesses every square inch of roofing, including vertical flashings and around and under roof obstructions and equipment. This results in a comprehensive view of the roof's condition, with the possibility of errors virtually eliminated.

### **B. OBJECTIVE**

The objective of this investigation is to identify the areas of subsurface moisture or where moisture has penetrated the membrane and deck structure. Those areas are to be documented with roof markings and correlated on a roof map with real-life and infrared photos.

### **C. TECHNICAL APPROACH**

Due to the limited size of the roof, the thermographic survey was conducted by hand carrying the specialized equipment over the roof. Thermography or infrared scanning is based upon the ability of a specialized infrared camera to detect variations in temperature radiating from the roof surface and convert them into an electrical signal which is displayed instantaneously as a video image called a thermogram. This picture is displayed in a color tone similar to the image received on a color television set. The difference in tones, darker colors to lighter colors denotes variation in the roof's surface temperature of .02 C or more and is influenced by the moisture content of the insulation.

Under clear skies during the day, the roof acts as a large thermal collector, and can approach 160 F during the summer months. Any insulation laden with subsurface moisture absorbs this radiation and acts as a reservoir to regenerate the heating of the membrane after the solar effect has dissipated. The effect of wet and dry insulation on the surface temperature of the membrane is also a result of emissive cooling. This is heat loss from the roof as much as 15 C below ambient. In cooler weather, the introduction of moisture reduces the R-Value of the assembly, producing thermal bridges. These are localized warm zones which also produce lighter colored images on the thermograms.

When an abnormality on the thermogram appears, usually as a lighter colored area, it can be interpreted to be either wet or at one time wet and has lost some of its original quality of texture and strength. The outline of these areas is marked on the surface of the roof with spray paint: in some areas only a number is painted, as these areas had no definite pattern or the roof is completely wet.



## Infrared Roof Inspection Prepared for

CT Consultants, Inc.  
8150 Sterling Ct  
Mentor, OH 44060

DATE: October 13, 2019

PROJECT: Liberty Township Administration Building

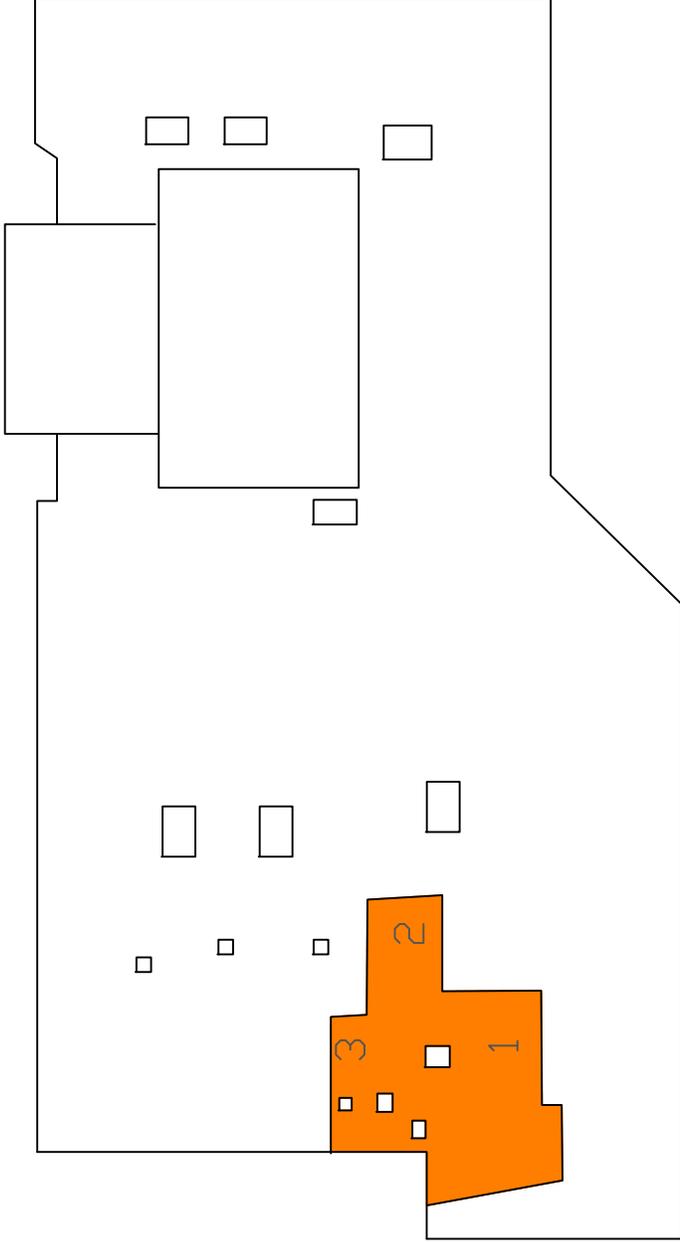
I hereby certify that the above listed project was thermogrammed by myself or under my direction and that the photographs, data and analysis are the result of the survey.

A handwritten signature in black ink, appearing to read "Tom Martin".

Tom Martin

Infrared Consultant

SPECIAL NOTES



Wet Insulation



# Liberty Twp Administration Building

1315 Churchill-Hubbard Rd  
Liberty Twp, OH 44505

Date: 10/14/2019

**PEMCO THERMAL, INC.** • INFRARED CONSULTANTS  
659-B LAKEVIEW PLAZA BLVD • WORTHINGTON, OH 43085 • PHONE: 614-885-3319 • E-MAIL: [tfpemco@aol.com](mailto:tfpemco@aol.com)

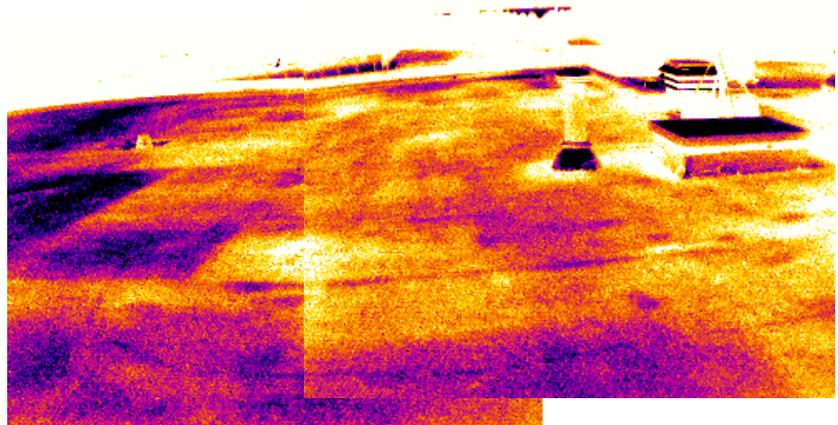
Scale  
1" = 30'  
(approx)



**Liberty Township Administration Building**



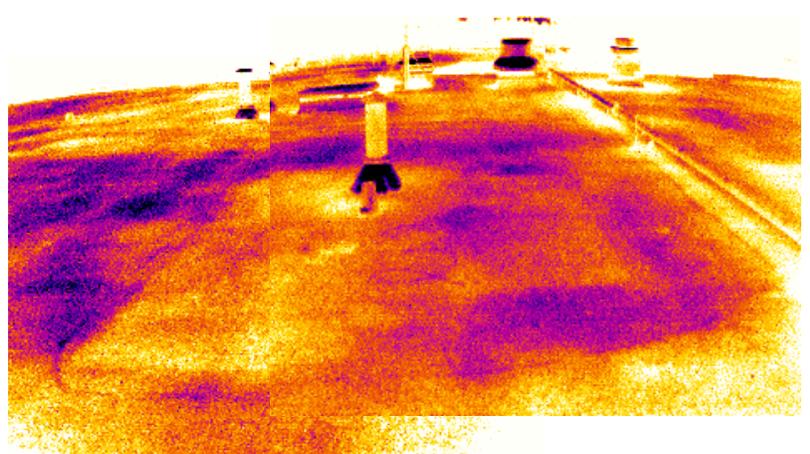
Visual image of area #1



Infrared view of area #1



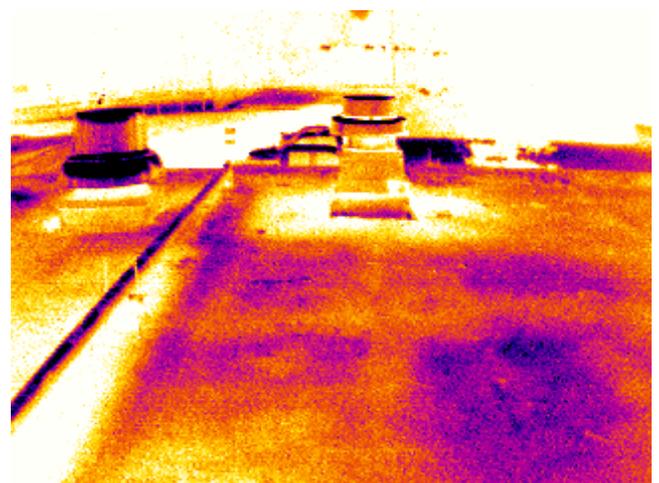
Visual image of area #2



Infrared view of area #2



Visual image of area #3



Infrared view of area #3