

INFRARED ROOF INSPECTION

Newport Townhomes

FOR:

Ruff Roofers, Inc. Mr. Nick Yewell 420 Kenecht Ave. Baltimore, MD 21227

DATE:

June 16, 2020

BY:

Infrared Predictive Surveys, Inc. P.O. Box 224 Adamstown, MD 21710

> Phone: 301-831-1978 Toll Free: 800-869-3720 Fax: 301-874-2295



SYNOPSIS

An Infrared survey of the roofs was made at the Newport Townhomes. Visual observations have been made and the data has been documented.

INTRODUCTION

This report has been prepared for the exclusive use of Nick Yewell at Ruff Roofers, Inc., for the specific application of the roofs at the Newport Townhomes, 310 Burnside St., Annapolis, MD 21403.

Authorization

Authorization to perform this evaluation, analysis and Infrared roof scan was in the form of a written agreement between Nick Yewell at Ruff Roofers, Inc. and Infrared Predictive Surveys Inc. (IPSI)

<u>Scope</u>

The scope of the roof survey included infrared thermography with nuclear backscatter verification. Data from this survey has been incorporated into this final report.

<u>Purpose</u>

The purpose of the roof survey was to gain an overview of the condition of the roof areas.

<u>General</u>

Observations described in this report are based upon roof at the time of the survey and these conditions may change as the roof ages.

Infrared Predictive Surveys, Inc. warrants that these findings are published after being prepared in accordance with generally accepted practices of the construction industry. No other warranties are implied or expressed.



TEST INSTRUMENT DESCRIPTION

(Only testing that has been completed during your survey will be checked.)

Infrared Testing

The infrared roof survey locates moisture in a roof by seeking areas of increased surface temperature. Roof areas that contain moisture have higher thermal conductivity and capacitance than dry areas. During the heating season, heat from the building interior is lost at a greater rate through wet roof areas and their surface temperatures are elevated. Alternatively, during the cooling season, solar heat is absorbed into the wet area, and then retained for hours after the sun sets.

When viewed through the infrared imager, wet areas appear as brighter, lighter tones of gray in black-and-white images. Alternatively, in color images, wet areas will appear as hotter colors. A color scale appears at the side of color images. As colors progress upward, temperatures increase. In general, the higher the concentration of water, the higher the surface temperatures.

Because higher surface temperatures, and consequently hotter colors, may be produced by several phenomena not related to moisture intrusion, tests are made to verify the findings of the infrared inspection using destructive testing (core cuts) and other nondestructive tests (capacitance & nuclear). Wet areas found by infrared testing are illustrated with thermograms (photographs of infrared images).

Capacitance Verification (Hand Held Tramex Meter)

The Tramex capacitance meter is a mobile device that is used for detecting relative moisture content of roof areas. This non-destructive testing method is often combined with nuclear and thermal testing and/or moisture intrusion testing to accurately identify water entry pathways and areas of entrapped water. The Tramex moisture meter is designed for testing built up roofing and non-conductive single ply membrane. It provides instantaneous, clear indications of roof conditions and is able to detect as little as 2% excess moisture in roofing systems.



Nuclear Backscatter-Verification

A radioactive isotope consisting of Americium-241 with a Beryllium target is utilized. The measurement method relies on the thermalization (slowing) of fast neutrons by the hydrogen atoms in water. Since other Hydrogen bearing materials also thermalize neutrons, a measurement survey is necessary to establish a relative base level before an analysis can be performed.

The meter used, Troxler 3216, is a portable instrument with a periodic counter to measure the rate of thermalization of neutrons.

Core Sampling

 \square

Core samples consist of cuts through the roof membrane. The sample provides an absolute test of moisture content and location. The core cut also permits the constituents of the roof system, and their condition, to be determined. Core sample may be weighed, dried and reweighed to provide a quantitative measure of moisture content.

A cut is made into the roof with a two inch (2") circumference roof sampling tool. The repaired core cuts are made with an appropriate material.

EQUIPMENT USED

The qualitative infrared scan was conducted by a certified thermographer using a Mikron 7515 uncooled infrared imager. Lens for the Mikron was 29 degree FOV, 320 X 240 array with 7.5-13 spectral response. Temperature sensitivity is .1 degree C with accuracy of 2%.

FLIR PM695 with a 320 X 240 focal array. Temperature sensitivity is 2+/- degree C.

Inframetrics-ThermaCAM SC1000. Temperature sensitivity is <0.1 degree C and a focal array of 256 x 256.

- FLIR PM390 Mid-wave
 - Troxler Model 3216 Nuclear Backscatter Moisture Gauge



FIELD SURVEY METHODS

Visual Observations

Visual observations were made by Infrared Predictive Surveys, Inc. (IPSI) personnel. These observations included roofing structure, roof drainage, roof surface conditions and other accessory items.

Photographic Documentation

Photographs were made by IPSI personnel. While these photographs were not intended to provide a complete record of the roof, they do provide a visual description of typical roof conditions or selected problem areas.

PROJECT IDENTIFICATION

Project Location

310 Burnside St., Annapolis, MD 21403

Roof Construction Materials

See core details below.

INFRARED ROOF SCAN

Date of Scan: June 10, 2020

This scan was performed in conjunction with the visual roof survey conducted the same day. The purpose of this scan was to locate areas of suspected subsurface moisture and determine the extent of the moisture migration.

Environmental Conditions

June 10, 2020 - Maximum daytime temperature was 85°F.



FINDINGS AND RESULTS

Infrared Findings

All core cuts were declined by the client.

- o Building 1
 - No thermally detected anomalies, consistent with moisture intrusion, were noted.
- o Building 2
 - One (1) suspected wet area was noted on the West side of the roof, from the chimney to the Eastern edge of the roof. The nuclear gauge confirmed this finding.



If additional information is required, please do not hesitate to contact me. Thank you again for giving us the opportunity to provide our services.

Sincerely,

Joseph Fitzpatrick Infrared Predictive Surveys, Inc. PO Box 224 Adamstown, MD 21710

 Phone:
 301-831-1978

 Toll-Free:
 800-869-3720

 Fax:
 301-874-2295

 E-mail:
 joe@infraredpsi.com

 Website:
 www.InfraredPSI.com



<u>APPENDIX</u>

- Maintenance Program
- Digital Photographs
- Infrared Photographs
- CAD Drawing



MAINTENANCE PROGRAM

The following is a recommended minimum for roof maintenance:

- 1. Inspect the roofs twice a year, once in the spring and once in the fall. An inspection of the building should also be made to check for structural problems that may affect the performance of the roof.
- 2. These inspections should include, but not be limited to base flashings, pipe penetrations, gravel stops, drains, equipment supports, the field membrane, rising walls, visible deck, and any leaks.
- 3. Clean debris and trash from drains and associated piping.
- 4. Any problems noted during these inspections should be located and recorded on a roof plan. Then roof membrane defects should be reported to the roof membrane manufacturer and temporarily sealed until permanent corrective action is taken.
- 5. After the inspection has been completed, specifications should be prepared for any needed repair that is not covered by the roof membrane warranty.
- 6. After the specifications have been prepared, any specified work should be executed within a short period of time and when weather conditions are conducive to proper application by a qualified contractor.
- 7. <u>New Roofs Only</u>: In addition to the items described above, a roof moisture survey should be performed on these roofs before final payment is made on the new roof, six months prior to the expiration of the contractor's and the manufacturer's warranty, and at least once every two years. This survey will detect subsurface problems that would go unnoticed during a visual inspection.
- 8. Accurate records should be kept of the inspections and repairs.
- 9. The roof inspections should be conducted by professionals experienced in locating and recognizing any problems or potential problems that may exist and that need to be addressed.



Newport Townhomes



Building 1-East side overview



Building 1-East side overview. No suspected moisture intrusion issued noted.



Building 1-Center overview



Building 1-Center overview. No suspected moisture intrusion issued noted.



Building 1-West side overview



Building 1-West side overview. No suspected moisture intrusion issued noted.



Building 2-East side overview



Building 2-East side overview. No suspected moisture intrusion issued noted.



Building 2-Center overview



Building 2-Center overview. No suspected moisture intrusion issued noted.



Building 2-West side overview



Building 2-Suspected wet area #2-1.



Building 2-Suspected wet area #2-1.

(J)

]	

'2'	τοτ		2112		FD			T = 50	
 AREA#		SIZE	503	SQ FT	<u>רר</u>	v v 🗲 I	NOT	ES	
01	10	X	5	50	_				
	F	יי וכ	_ _ _		ישרי			`	
	ł	τUI		RUL	JFt	-KS), IIN(J.	
	NE	ΞW	PO	RT -	ΓO	WN	HOM	1ES	
		3′	10	BUR	NS	SIDE	E ST.		
	A		JAF	POLI	S,	MD	214	03	
					_ \ /				NI
			א ה ם∣ם	RAWN:	– IVI Date			- 30A V: Shee	T NO.
	PREI SUF	DICTI RVEY RPORAT	VE 'S ED	AJR	06,	/15/2	20 0	88	32A