WATER INTRUSION TEST AND INFRARED INSPECTION

Date of Inspection: March 15th, 2012 start time: 9:30 AM

Weather: Clear skies, 90 degrees F,

Inspection Address 123 ABC St.
Anywhere, NY 11201

Principal Inspector/Thermographer: Mr. Scott Gressin

INTRODUCTION

Professional Building Inspectors, PBI, performed various water intrusion tests including the use of thermal imaging at the above address in an effort to locate the source of water intrusion that have been ongoing in the building.

The thermal imaging camera used by PBI is a highly sensitive and calibrated device that enables our inspector to see the infrared spectrum. This wavelength of energy is indicative of the heat energy of a given object. In most applications it is not the temperature reading itself that is

important but rather the pattern of temperature differentials. Using our knowledge and skill in building construction and environmental consulting we interpret patterns in the images to determine if defects are present, as well as the cause and origin.

The inspector and Thermographer for this report is Mr. Scott Gressin. He is a licensed New York State Home Inspector and a Certified Building Science Thermographer. He also holds certification as an E.I.F.S. Inspector, NYS EPA asbestos investigator, lead inspector and is a Certified Indoor Environmental Consultant (CIE-C) by the Indoor Air Quality Association.

GENERAL INFORMATION

Information provided by you in our previous onsite meetings and telephone conversations are that the structure was built in 1941 originally more recently has undergone renovations and upgrades. The building is a two story residential structure located in Anywhere, NY. The building is attached on both left and right sides to neighboring buildings. The rear of the building is not attached to any adjacent structure and there is a small courtyard with access via the adjacent storefront.

The exterior cladding consists of a combination of brick, concrete masonry and vinyl siding on the front and rear. There is a small patio area located behind the rear bedroom on the second floor with the kitchen and bathroom directly below the outside deck. These results in an approximate 6’ set back. The roof of the building is an asphalt-based torch down roof. There is a roof drain system that brings water from the roof into the building and down via dedicated drains above the finished ceilings.

INSPECTION PROCESS

On the date of the inspection process began with a visual inspection of building and a discussion with you, the owner, regarding areas of the building that are known to have active water leaks. This inspection and discussion revealed three (3) separate leaks in the building; bathroom ceiling, the kitchen ceiling, basement (approximately 6’ in from the rear wall) and the rear wall itself of the basement (brick) exterior wall.

In each of these locations we found water stains on the sheetrock and trim consistent with prior water intrusions. The images below are typical of the building on the date the inspection was performed. Please note that these images reflect the accessible interior spaces and exterior surfaces of the building as viewed from the ground, roof, and balconies. At no point did PBI utilize a ladder, hoist or boom lift. Accordingly we can only report on those portions of the building that were able to view.
Area of water stain indicated with red arrow.
Water staining noted at lower right corner of door

PBI referenced several industry standards and guidelines when performing this inspection. These standards were modified to accommodate for the construction of the building and its associated structures, the availability of the water source provided, solar loading estimations and the fact that the investigation was geared to be non-destructive. On site we calibrated the water spray rack assembly to deluge 5 gallons per square foot per hour. Image below shows pressure and volume calibration on site.

**Rear Wall:**

Our first test of the day was performed on the rear brick wall, below the level of the kitchen window header. At the onset of the inspection we documented the interior conditions in the area of interest.

Prior to any water testing we performed a baseline survey of the interior building materials consisting of a Delmhorst BD210 moisture meter testing of the plaster walls, wood window sill and a baseline thermal imaging survey. The Delmhorst BD210 moisture meter was field calibrated and found to be within calibration standards. Baseline thermal imaging was within normal limits.
Water testing was initially performed on the rear wall as shown below.

In less than 5 minutes of water flow significant water intrusion occurred in the basement of the home on the rear wall. Upon gaining access to the rear courtyard via the funeral home large defects in the brick mortar joints were noted along the entire wall, aligning perfectly with the water entry into the basement. Image below is typical of these defects.
Higher on the rear wall:

Next the spray bar was lifted above the level of the kitchen window header and the water turned back on. Water was run for 15 minutes in this test location. Serial thermal images of the kitchen ceiling and bathroom ceiling showed no changes from baseline IR images. The kitchen window over the sink did develop a leak. Close inspection of the wood trim shows moisture damage in this area. Water continued to pour into the basement along the rear wall during this test cycle as above.
Baseline readings prior to water testing. All readings were 0.3% or less.

IR images of the rear kitchen window. Close up image on left shows water entry (dark area)

**Patio Door**

Our third test location was the patio door. Baseline moisture readings and IR scans were performed in this location and elevated moisture was noted at the base of the door on the trim.
The water spray rack was disconnected and the hose alone was used to gently wet the exterior patio / door flashing.

In less than 5 minutes of flowing minimal water in this location we found the patio to have poor drainage and ponding of water along with IR images indicative of water intrusion into the bathroom ceiling directly below.

Baseline IR image on left, post test IR image on right.
Baseline IR image on left, post test IR image on right. Red arrow indicated area of changes and water entry confirmed by moisture meter testing.

CONCLUSION AND RECOMMENDATIONS

In our professional opinion, based on the testing performed as described above the water intrusions are the result of a combination of factors. These include:

1. Deteriorated brick mortar on the rear wall of the building with resultant water intrusion into basement along the rear wall.
2. Defective rear kitchen window with small water intrusion.
3. Major source of water intrusion into the second floor rear bedroom, bathroom ceiling directly below and basement ceiling directly below is the result of defective construction of the patio floor, flashing, and roofing membrane.

My observations and conclusions are based solely upon the conditions found at this site on the date of the inspection and historical information provided by the building occupants. As to be expected in a forensic inspection such as this, where the roofing, flashing and patio has already been installed, not all portions of the building and drainage planes are accessible for inspection.

We recommend you discuss these above items with a qualified water proofing contractor.

1. The rear wall in its entirety needs to be pointed and water proofed. You should try and coordinate this with your neighbor as the buildings are intimately related in this location and fixing just you ½ may not correct the issue.
2. The patio off the rear bedroom needs to be removed down to the structural framing.
   a. All materials must be removed.
b. Once this has been done proper drainage slope established

c. New wall flashing and roof membrane installed
   And

d. Ultimately new decking, preferably a wood deck with removable sections to allow
   maintenance and cleaning.

3. When funds allow replace the kitchen window.

Should you wish, you can have any of your contractors contact me to discuss these findings we
would be happy to speak with them. Should you have any questions regarding this report please
do not hesitate to call our office.

Sincerely,

Scott Gressin

Certified Indoor Environmental Consultant # 0705065
NYS Home Inspector License #16000028893
Certified EIFS Inspector #785806
Certified Infrared Thermographer #32227
Certified Environmental Thermography Consultant #1005010
NYS EPA Asbestos Inspector #07-07380
EPA Lead Inspector Risk Assessor #NY-R-17027-1
Council Certified Structural Drying Supervisor #1011032

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