

## EXPERT REPORT

of

Roger Greenwald, AIA

May 19, 2020

Re: [REDACTED] v. [REDACTED] and [REDACTED]

Mr. Paul Feliciano, Esq

DeSena&Sweeney, LLP

### Assignment:

I have been engaged by the law firm DeSena&Sweeney, for case preparation, review of records, investigation, evaluation, assessment, analysis and preparation of an expert report. This constitutes my expert report for my opinions relating to the aforementioned case between Mr. [REDACTED] ("Plaintiff") and [REDACTED] ("Defendants") relating to the fall accident at [REDACTED], Queens, New York. The opinions contained herein are made to a reasonable degree of certainty in the construction and architectural industry, based on the information available to me.

### Summary of Experience

I am a registered and licensed Architect in the State of New York, and a national award-winning general contractor with over 40 years of experience in high-end residential design, construction and remodeling. I founded Greenwald Cassell Associates, Inc., a licensed Class A General Contractor in the state of Virginia, in 1984, and was awarded the National Gold Medal for Full House Renovations Over \$500,000.00 in 2008 by the remodeling industry's leading trade journal, Qualified Remodeler Magazine. I have designed and constructed over 800 residential and commercial projects, approximately 85% of which involved skylights of the general type involved in this case. I have directed the installation of these skylights across a wide range of applications. I am deeply versed in their structural characteristics.. Based on my professional experience, I am familiar with the relevant industry standards, practices and customs in the construction industry and architectural profession that exist now, and at the operative times at issue in this lawsuit. I am qualified to analyze and evaluate subject property, and the roof elements involved in the accident under investigation

### Relevant Background:

I have studied the allegations of Plaintiff's expert, Mr. [REDACTED]. I have investigated the load bearing requirements and structural specifications of the Velux roof element which failed. I have studied and evaluated the relevant building codes, including owner's obligations and code requirements.

I have considered the following documents:

1. Complaint
2. Deposition of [REDACTED] with exhibits
3. Photographs produced by Defendants in discovery
4. Plaintiff's Expert Report submitted by Mr. [REDACTED], PE.
5. New York City Building Code 1968
6. New York City Building Code 2014
7. Velux manufacturer's test data

## **OVERVIEW:**

- a. In order to determine whether the subject "skylight" in this case was installed in violation of code as alleged by Plaintiff's expert, it is essential to first determine which building code governs in this case. Plaintiff's expert, Mr. [REDACTED], incorrectly bases the allegations contained in his report on the wrong code. Plaintiff's expert incorrectly cites the New York City Building Code 2014, with some possible references to the New York City Building Code 2008. The 2014 code and the 2008 code cited by Plaintiff's expert contained material changes from the relevant governing 1968 code, leading Plaintiff's expert to incorrect conclusions regarding the structural and safety requirements for the roof elements considered in this case.
- b. Subject "skylight" was installed "32 years ago", in or around 1988. As such, it would have been installed subject to the code governing at the time of installation, which was the **New York City Building Code 1968**.
- c. Plaintiff's expert's fundamental error, rooted in his misunderstanding of which code governed in this case, leads him to a cascade of improperly linked and incorrect conclusions, which all stem from his misunderstanding of the code and its requirements in this case.

Based on my evaluation, I can offer the following expert opinions:

## **OPINION ONE: Conformance with relevant code**

1. The "skylight" in question conformed to the relevant building code, which is the **New York City Building Code 1968**.
  - a. Technically, this unit, a Velux CMA series 4'x4' domed plastic skylight, is actually not considered to be a "skylight" under the definitions of the 1968 building code. It is considered to be a roof element, subject to very different, and more stringent safety and structural strength requirements, all of which it meets:
    - i. Subchapter 5, article 4, subsection 27-338 Roof Structures (NYC Building Code 1968) states: "*Skylights. For the purposes of this section, the term "skylight" shall be construed to include the sash, frames and glazing of roof monitors and sawtooth roofs*". This very specific definition does not apply to this case: subject domed plastic element is neither a roof monitor nor a sawtooth roof.

Because this unit does not fall within the definitions of a “skylight” according to code, it is governed by the more stringent requirements of a roof element, as stated in Subchapter 9, article 3, subsection 27-561 of the 1960 NYC Building Code, to wit:

## **§27-561 Roof Loads**

(a) Live load. Minimum design live loads shall be as follows:

(1) For roofs with slopes up to and including twenty degrees from the horizontal, thirty psf of horizontal projection

- ii. Velux, the manufacturer of subject unit, follows industry standards in the design and testing of their “skylights”, which meet or exceed the code requirements for roof elements. Velux units test out at a minimum of 30psf, which fully meets the 30 psf called for in the NYC Building Code 1968. More importantly, Velux OSHA FALL TESTING, included in Appendix A of this report, states:

*“OSHA Fall Protection: This skylight model tested to support maximum concentrated static loads up to 800lbs without failure.”*

This means that the unit has been OSHA tested to withstand the weight of four 200 lb men standing on it, without failing. See Velux Data document, attached as Appendix A to this report. OSHA is the Occupational Safety and Health Administration, the federal governmental agency responsible for setting and enforcing standards of safety in the construction industry.

## **OPINON TWO: analysis of Plaintiff’s report errors**

The following allegations contained in Plaintiff’s expert report by Mr. [REDACTED] hacter are incorrect:

1. Mr. [REDACTED]’s statement on page 8 of his report that: *“The skylight installed by the defendants, on the roof of 60-56 55<sup>th</sup> Street, Maspeth, New York...did not meet the building codes that were in force at the time the skylight was installed...”* is incorrect for the reasons delineated In Opinion One above: Plaintiff’s expert is confused as to which code governs in this case. The “skylight” is in fact compliant with the NYC Building Code 1968. His allegations are based on irrelevant later codes.
2. Mr. [REDACTED]’s statement on page 8 of his report that: *“The NYC Building Code defines a maximum live design load of three hundred pounds over any area of one-foot by two-feet”* is incorrect. Mr. Schacter’s faulty logical chain, despite being obfuscated by a lack of proper specific code citations, can be derived and stated as follows:
  - a. This conclusion was incorrectly derived from codes subsequent to the relevant governing 1996 NYC building code. His conclusions are rooted in the irrelevant 2014 code and/or the irrelevant 2008 code. That is the wrong code, and it does not apply in this case. Even if it were the correct code (which it is not) his conclusions are still incorrect because he does not interpret those codes correctly, as discussed below.

- b. The 1968 code does not have a 300 lb per square foot structural load requirement by any correct reading of that code. The operative load bearing capacity of the unit, as explained above, would be 30 pounds per square foot, plus the more stringent OSHA fall testing requirement cited below. Velux tests their units to meet or exceed that standard, and the Velux test data contained in Appendix A demonstrates that this unit clearly meets or exceeds these code requirements.
        - c. Mr. [REDACTED] compounds his error, even within the irrelevant 2014/2008 code, by concluding that the Velux unit is to be governed by the structural requirements of a “skylight”, rather than by the more stringent and correctly applied structural requirements of a roof element. A correct reading of even the irrelevant codes cited by Mr. Schacter clearly leads to the conclusion that units placed flat on a flat roof are not considered “skylights”, but are considered roof elements, and governed by the code requirements of roof elements.
        - d. Mr. [REDACTED] then continues to compound his chain of erroneous code interpretation by citing standards contained appendices of the wrong code for a “glass walking surface”, which is a complete misreading of the correct function of the Velux element in question in this case. These definitions, ie: “skylight” and “glass walking surfaces” in the building code are technical, clearly and narrowly defined in the building code. They are highly specific, and not, as Mr. [REDACTED] implies, broadly descriptive in layman’s terms. The Velux unit meets none of these definitions of a “skylight” or a “glass walking surface”, according to the code. To impute a broad, layman’s interpretation to a narrowly defined code definition is an incorrect analysis and leads to the false conclusion at the root of Mr. [REDACTED]’s report.
2. Mr. Schacter’s statement on page 8 of his report that: *“The defendant’s plastic bubble could not support this specified weight equating to over 600 pounds”* is incorrect and directly contradicted by the Velux OSHA Fall Test data attached to this report as Appendix A. The unit has been tested under stringent OSHA auspices at up to 800 pounds without failure. (See appendix A, attached to this report)
3. Mr. [REDACTED]’s statement on page 8 of his report that the unit required metal mesh, guard rails, restraint systems, and barricades is also incorrect. This allegation clearly confuses the requirements of true skylight units used in monitors or sawtooth roofs with roof elements which must meet the more stringent strength requirement of 30 lbs/sq ft per 27-561 as cited in OPINION ONE, 1, ii. above.
  - a. It must be noted that the structural requirements of a roof element are *more restrictive* than the structural requirements of a “skylight” as defined by the Code. The guard rails, screens, and other protective elements required of a skylight are required only because a skylight is assumed to have a *lower* resistance to downward force than a roof element. Stronger roof elements, such as the engineered Velux unit do not need these additional fall barriers. The classical skylights which require guards and screens were typically thin glass. They were not designed to withstand a person’s weight. They were in fact designed to be easily broken by a fireman’s ax to vent a building on fire. The railings and screens were necessary for that application, but are irrelevant to the plastic bubble under consideration in this case. When two or more code definitions are in competition, the

more restrictive definition rules. The fact that the commercial skylights produced today are engineered and tested to meet or exceed code requirements for *roof elements* means that they are engineered to meet the *more restrictive* requirements which govern roof elements, and therefore do not need the guard rails, screens or other protective elements which are required when a skylight is designed to a standard less strong than a roof element.

4. Mr. S [REDACTED]'s statement on page 8 of his report that: *"There was no restraint system or barricade, either integral with or below the skylight as required by code to prevent Mr. [REDACTED] from falling two stories and landing on the staircase below the skylight"* is correct. There are no such elements, because none are needed, nor are they required by a correct reading of the relevant code: the NYC Building Code 1968.
5. Mr. S [REDACTED]'s statement on page 9 of his report that: *"By installing the plastic bubble skylight at that time, the defendants violated the New York City Building Code"* is incorrect. Mr. [REDACTED] has cited a code irrelevant to this case. He has misinterpreted the wrong code. And he fails to understand how the unit in question does in fact conform to the relevant code, if that code is properly understood.
6. Mr. [REDACTED]'s allegation on page 9 of his report that "no permits were identified" in his search may or may not be accurate, but is not dispositive for the following reasons:
  - a. The records of the NYC Department of Buildings are by no means 100% accurate. Numerous instances exist where permits, particularly permits predating computers, were lost and/or misfiled.
  - b. The NYC Department of Buildings enjoys broad discretion in where to draw the line on requiring permits. Homeowners calling NYC to ask if a permit is required for a particular roof repair may be advised in the negative, if the official on the phone decides to grant latitude, as is the right of the jurisdictional authority.
  - c. We therefore cannot conclude beyond a reasonable doubt that Mr. [REDACTED]'s failure to discover a permit for roof repairs performed 32 years ago constitutes negligence on the part of the owner, as Mr. [REDACTED] implies.
7. Mr. [REDACTED]'s allegation on page 9 of his report that *"If the defendants had applied for a permit for the installation of a plastic bubble skylight, on a flat roof, the reviewing building inspector would have notified them that their intended skylight installation was not compliant with building codes"* is incorrect. This was a normal installation of a sturdy, engineered unit with OSHA tested fall resistance of 800 lbs. There is no basis in fact for Mr. [REDACTED]'s allegation.
8. Mr. [REDACTED]'s allegation in his Conclusions on page 9 of his report that *"The plastic bubble skylight that was on the defendant's roof was not approved for a low slope, walkable roof installation"* is incorrect. These units are often and properly adapted for flat roof applications, with proper flashing.
9. Mr. [REDACTED]'s allegation on page 10 of his report that *"The plastic bubble skylight on the defendant's roof was not designed to be a load-carrying structural member"* is incorrect. This unit

has been engineered and OSHA tested to support the weight of four large men standing on it, or walking or falling across it, per Appendix A, attached to this report.

10. Mr. [REDACTED]'s allegations of negligence are without basis in fact, and result from a misreading/misunderstanding of the NYC Building Code.
11. Mr. [REDACTED]'s conclusion that negligence on the part of the owner was the proximate cause of Mr. [REDACTED]'s fall is therefore fallacious.

In conclusion, the Velux unit conforms to the structural requirements of the New York City Building Code. It is not governed, as Mr. [REDACTED] incorrectly suggests, by the 2014 or the 2008 building code. Those codes did not even exist when the unit was installed in or around 1988. The Velux unit in question is not technically a skylight as defined by the building code, but rather must and in fact does meet the more restrictive structural requirements of a roof element, ei: it must support a live load of 30 pounds per square foot, and meets or exceeds the OSHA Fall Test requirements.

## **OPINION THREE: FORENSICS**

Clearly, Mr. [REDACTED] somehow broke the Velux unit and fell. I was asked to conduct a forensic analysis of how an engineered plastic bubble, OSHA rated to resist an 800 pound fall, might have been made to fail. Plaintiff alleges that he tripped and fell onto the skylight from a crouching position on the roof while reaching for money. His weight is given as 170 pounds in the documents of this case. I conclude, within a reasonable level of architectural certainty, that a man weighing less than 200 falling on the skylight from a crouching, standing or walking position on the roof surface, level with the skylight, would have de minimis acceleration on impact. So the force of his fall would be his essentially his weight, less whatever weight was transferred from his feet to the roof at the moment of impact. But even assuming that Plaintiff's feet had totally left the ground (that's an unusual fall!), he would still impact the unit with around 200 pounds of force. This would not have been enough to cause the skylight to fail. So what sort of events could have caused a catastrophic failure of an 800 lb. OSHA fall tested skylight? While I cannot speculate as to what the defendant was doing at the time of the failure, I can say that the general class of events which might cause an 800 lb. Osha tested plastic domed skylight of this class to fail would include constant, repetitive impacts such as repetitive jumping, dancing, or other activities which would concentrate force repetitively and set up a wave phenomenon. With sufficient abuse of this nature, the force generated by repetitive pounding could have caused the unit to fail. Normal standing, walking, or falling on this skylight would not have been sufficient to cause the failure described.

# ROGER GREENWALD, ARCHITECT PLLC

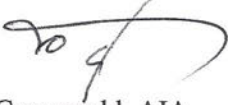
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ROGER GREENWALD, AIA

## STATEMENT REGARDING NATURE OF REPORTS

Matters set forth herein are based on information made available to me at this time. As additional information is obtained, the opinions and statements set forth herein could be supplemented or be refined. A copy of the referenced exhibits, and pertinent pages of the referenced transcripts are attached hereto as **Exhibit A.**

Respectfully submitted,



Roger Greenwald, AIA

