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Virtual Technology Solutions for Forensic Construction Litigation

I. Modern Construction and Litigation Technology

There are multiple tools and devices now available to construction companies, insurance companies, and defense attorneys which can be used to help more efficiently minimize potential risk, value claims, and analyze mechanisms of injury/damage post-loss. These include:

Drones

Drones are no longer the exclusive toys of government entities or reserved for only large loss accident investigation. The size, price, abilities, and ease-of-use of “unmanned aerial vehicles (UAV)” or “drones” as they are commonly known has become common place. They are now basically consumer electronics to be used by the masses. With minor training and minimal licensing/registration, companies can now use UAV’s to assist tasks previously reserved for helicopter flights, building swing-stages, and dangerous employee activities. Brief examples of drone types and capabilities will be discussed.

3-D Scanners and Point Clouds

Modern construction site and/or accident scene modeling can now easily be accomplished through the use of computer based 3D scanners. The effectiveness and abilities of the areas scanned (both indoor and outdoor applications) can help analyze areas of potential risks, construction site damage and mechanism of injuries from a variety of perspectives and conditions.

The key to any quality scan is the acquisition and total number of data points or “point clouds” as they are known. Basically, each point of any surface, in any directional plane, is a potential point cloud. When a scan is performed, the scanning laser identifies the point and electronically maps it. The more scans that are performed over a given area results in more point clouds being recorded. More data points result in more detail and greater ability to change perspective, obtain critical distance measurements, etc.

As a practical example, imagine that you want to scan the interior of your office. A single 360 degree scan may allow you to see the window casing, the book shelf, and the computer monitor on your desk. Scanning the room five times may permit you to see books on the shelves and the computer keyboard in front of the computer monitor. However, scanning the room one hundred times may permit you to recreate a virtual office on your computer screen whereby you can see and measure the differences of thickness of each book on your bookshelf, the height transition between the individual keys on your keyboard, and even the paper clip lying on the carpet next to your trash can.

Computer Based Accident Analysis

Once the video recordings have been made, or the 3-D scans have been completed, the real fun begins. The data acquired can be input into various computer programs to produce a variety of tools for the target user.

A. 3-Dimensional Static Visualizations

Think of a static visualization as basically a photograph. It is a snapshot of a particular area at a particular time. However, computers now permit us to look at that area from a variety of angles, perspectives, and conditions. For example, using our interior office scenario described above, a static visualization produced from the acquisition of 3-D scanner point cloud data points may permit us to create the image of our office as though we were sitting in our chair behind our desk. There is nothing shocking about that, right?

However, with the computer's assistance, we can then change the perspective and create an image of the same office from the perspective of sitting in the guest chair, standing in the doorway, or even looking inside from the window. Furthermore, we can change the lighting condition and examine what the office would look like without the interior lights, or even with the morning sunlight coming through the window. Changes in perspective often produce additional pieces of evidence not otherwise available to the forensic examiner.

B. 3-Dimensional Animations

3-Dimensional Animations take the 3-D static visualization to the next level. Using the same data and video obtained from other devices such as drones and 3D scanners now permits construction industry representatives, insurance risk analyzers, and forensic experts to both create the potential "virtual" construction site in order to analyze future conditions as well as to re-create specific construction sites and industrial accidents in order to analyze the subject loss, make liability determinations, and properly value the alleged injuries/damages.

Using our same office example, computer animations will allow us to not only see what it looks like in our office at a given time, but what it looks like actually walking into our office from the hallway at a given time and with specific lighting. In the construction world, accidents can now

be recreated using the data collected from the actual vehicles and machinery involved. This can help show what the individuals should have seen, what precautions what have been taken, and risks either could be, or could have been avoided altogether.

From a worker's perspective, the ability to utilize specific pieces of equipment and/or specific construction techniques in limited spaces can be addressed long before such tools are delivered to the jobsite. For example, will the suggested crane fit into the available space at the northeast corner of the property, could the ceiling work on the second floor actually be completed with three portable lifts rather than four, etc.?

Technology Matches and Predicts the Environment

As mentioned above, the ability to create different construction scenarios is a very valuable tool available today through the use of computer modeling techniques. For example, in some construction related accidents, lighting (i.e., daylight vs. darkness) can make huge differences in liability analysis. In many cases the initial questions include "What *should* the Plaintiff had seen?" compared to "What *could* the actually Defendant see?"

In many construction defect cases, the issue is not "daylight vs. darkness," but is instead "wet vs. dry." Computer modeling can help track such things as exterior water flow, paths of internal moisture intrusion, and the ability to affect allegedly damaged materials (i.e., could the leaking window really have damaged the microwave two rooms away?).

II. Proactive Use of Technology During Underwriting, Design, and Construction

A. Insurance Carrier Perspective -- Underwriting Stage

In the early stages of construction, computers and other devices can be utilized by underwriters and industry professionals to assess potential risks with the proposed construction site or methods. Use of such technology helps minimize overall project risk and permits continuous monitoring of various aspects of each project. For example, both projected and continuous computer modeling, documented routine inspections, etc., help the liability insurer as well as the construction entity itself maintain high levels of quality assurance and quality control. Mandatory employee safety meetings and project walk-throughs can now be easily recorded and stored for future reference.

Use of advanced personal safety gear, including but not limited to, body cameras and wearable biometric devices, provide feedback on a specific employee's work environment (i.e., what can he/she see while working in the crawl space above the 17th floor) and on their body tolerances (i.e., is the extreme heat increasing heart rates to unacceptable and unsafe levels such that work should be suspended during certain hours?).

Advanced computer modeling, sometimes referred to as “Building Information Modeling” or “BIM” can even assist in project scheduling to minimize risk and delays caused by yearly weather conditions, such as potential snow accumulation, Santa Ana winds, fog and rainy season mold and mildew concerns, etc. All of these factors can now be assessed months before any construction project actually begins to physically manifest at the job site.

B. Current and Ongoing Construction Projects

During the construction project itself, construction companies and their respective liability carriers of all sizes can now easily utilize modern technology to assist in project monitoring and recording. A single designated worker with a low-end drone and a GoPro camera can now perform, record, and easily electronically store weekly site/project general progress inspections. If necessary, specific areas of high-rise structures, roadway projects, and other large projects can be monitored and examined in brilliant high definition video. Hundreds of hours of such footage and progress inspections can be stored on a single computer hard drive.

Use of these techniques benefits the construction industry as a whole. It minimizes employee risks (think about high rise flyovers, exterior wall inspections, etc.). It protects and supports specific claims and helps reduce potential losses. How many claims could be either avoided, or resolved very quickly if there was visual evidence of the site conditions at or near either the actual time of loss, or at the time the final work by a specific contractor was completed. From the insurance perspective, how many ambiguous coverage questions could be more easily answered if there was documentation of the actual project condition or work being performed at the time of the subject loss?

C. Post-Loss Insurance Perspective

Depending on the potential exposure, the use of this new technology with Drones and Computer based Accident Analysis can greatly assist the handling of a claim through a variety of ways including:

1. A written report with the expert’s opinions can be enhanced with actual video showing the damage or cause thereof. Instead of being reserved for use only at trial, such video-enhanced reports can now be disclosed early in litigation as an aggressive defense strategy to place plaintiffs on the defensive to explain and support their version of the incident in question.
2. Information that is clear and concise can help both the expert and counsel present a strong defense at trial.
3. The use of this technology demonstrates a willingness by the carrier to provide a vigorous defense.
4. Despite the up-front costs associated with using the technology, the end result is often a lower settlement or verdict amount which equates to overall savings for the company and liability carrier.

II. Post-Loss Litigation Forensics

Use of modern technology in post loss forensic examination is becoming both commonplace and critical to a successful and efficient claim defense. Use of computer animations, video recreations, computer modeling has become so routine that challenges to the admissibility of such tools into the evidentiary proceeds and jury disclosure are becoming harder and harder to obtain. That is, computer modeling has become the industry standard. Their effect is overwhelming. Today's juries like great theater. They like to be entertained by the multiple perspectives, accident recreation, proof of deficient construction techniques, etc. What is better, hearing about an industrial crane failure, or seeing it occur from multiple angles as it is displayed on a theater sized courtroom wall?

Put simply, today's juries are getting smarter. They are technologically savvy. They like the internet, carry smartphones, and watch satellite television with hundreds of channels. The more information available to them the better; Objective evidence defeats speculation; Visual presentation defeats word descriptions. Videos and recordings prepared and stored by a contractor during the project and used during future litigation is always better than witnesses theorizing what may have been there at the time of loss, how he or she may have installed certain things, what phase the road project may or may not have been in on a particular date.

As mentioned above, technology, from a practical standpoint, can place plaintiffs on the defensive. They may have their wild theories about what may or may not have happened or what should or should not have been done to prevent the incident in question. However, if there is actual visual evidence, undisputed objective evidence, and super accurate computer generated calculations which definitively show what actually occurred, an opposing plaintiff is going to have some explaining to do to the judge and jury. Imagine a scenario where a plaintiff's own testimony is displayed on half of the display screen and the defendant contractor's actual video recording conflicting with Plaintiff's claims are displayed on the other half of the courtroom display. How would the Plaintiff or even the Plaintiff's paid expert witness overcome such a powerful presentation?

- Presentation of computer animation disproving Plaintiff's accident description in actual litigation case will be shown.

Therefore, technology is not only the future, but is the present. Using technology as a proactive, preventative, and post-loss forensic tool can provide money and time saving results as well as enhance the overall safety of specific workplace environments. Using at least a portion of the devices described above should be considered in every project regardless of its size or value.