Caskanette Udall
CONSULTING ENGINEERS

FORENSIC ENGINEERING NEWS AND VIEWS

Spring 2011

Veir Guy vs. City of Toronto

Rene Caskanette, P. Eng

This involved a slip and fall injury in an icy laneway in March 1999. Ms. Guy fell on the ice and was injured. She started a claim against the City and it moved along slowly until we were retained in the fall of 2007 to review the facts and prepare an expert report on the cause of the accident. It finally reached trial a year later in the fall of 2008 with Alan Preyra as counsel for the plaintiff. A decision in favor of the plaintiff was rendered and it was appealed and upheld. It is now in a second appeal hearing. The wheels of justice do turn slowly.

Our firm handles many types of personal injury accident investigations including municipal cases and those on private property. Slips on ice, trips on ledges, falls from ladders, car accidents on icy roads, diving accidents, falls on stairs, falls in potholes or irregular surfaces, work place injuries, arena and playground injuries, and many others in unique circumstances are within our expertise.

For slips on ice or snow on municipal property the important facts are weather (precipitation and temperatures), type of surface treatment used (salt, sand, other), inspections, response time for application of salt, and compliance with the municipal maintenance manual which will establish the minimum criteria to be adhered to.

These cases often come down to demonstrating that the surface was slippery and caused the accident, and then arguing about whether the actions taken by the municipality were reasonable to maintain the surface in a safe condition. This was the case for Veir Guy.

Decisions to use salt, sand, urea or other deicers have differing consequences and these decisions can be challenged as being the cause of the slippery surface. This was an issue in this case. The bigger issue was the lack of snow removal in the laneway.

Critical facts in this case at trial included:

- The City manual included snow removal and salting criteria for municipal laneways. The criteria were not followed in this situation.
- The City followed a policy of not plowing the laneways since they were small and difficult to plow. We identified equipment suitable for the task.
- The City did not inspect the laneways during their patrols, as required in the manual.
- The laneway ran between a subway station and a high school and was used regularly by pedestrians along with vehicles. In a situation like this the minimum criteria are not sufficient and extra care is required.
- The City policy to just salt the laneway may have been followed but records were scarce on this issue. We testified that salting without plowing is not an effective method of preventing ice formations in the laneway.

We reached the final conclusion:

1. The slip and fall was the result of improper maintenance and inspection of the walking surface, causing the coefficient of friction to be reduced to the level that created a slip hazard.

The judge agreed with our opinion and found the City of Toronto liable for injuries to Ms. Guy.

This was the first trial where a City of Toronto laneway was the site of such an accident. The City policy on laneway maintenance was challenged, and they resisted the claim to avoid setting a new precedent for future cases.

What was interesting was the fact that even though we were retained long after the accident, we were able to work with existing documentation to prepare a report which was helpful to the judge and played a major role in the outcome. It's never too late, pull those dusty files off your shelf and give us a call.

New Staff

We would like to welcome 3 new members to our staff.

Peter Johnston has worked with us on a limited basis for the past few years. He has now joined us as a permanent member of our staff. He has extensive experience with failure analysis, accident reconstruction, fire investigation, and hazardous materials. Peter works from his home office in Burlington.

Glenn Tatsu has joined our staff as our draftsman. Glenn can generate all types of CAD drawings including structural and hydrogeological drawings and can attend on site to obtain necessary measurements. Glenn works from his home office in London.

Liz Falsetto joins us as our new part time office assistant in our head office. Liz will assist Gail with all of our administrative tasks. Liz will be in the office several afternoons a week.

Vehicle Impacts to Buildings

By Micheka Caskanette, P. Eng.

Each year we investigate numerous claims related to buildings that have been impacted by a vehicle. Once a building has been hit by a vehicle, home owners typically begin to examine the entire structure thoroughly. Often, they find pre-existing damage that they believe to be related to the impact because they had not seen it there before. It can be difficult to determine which damage is new and which is pre-existing, and often times an expert is needed to help make that determination.

The most common type of damage disputed is cracking outside of the area of the impact. This can be to interior finish materials such as drywall, concrete foundation walls, mortar/bricks, or structural wood framing.

Depending on the age and quality of the building, there are things to consider when examining areas to determine whether damage was pre-existing or not. Things to look for that may indicate a crack is new would be debris on the ground in the area of the crack, seeing jagged edges on an exterior wall crack in an area that is exposed to the elements, or seeing the crack propagation moving away from the area of impact.

Things that may indicate a crack is older would be evidence of a previous repair job, efflorescence (discolouration, typically white) in the area of the crack, or discolouration inside the crack which typically indicates it is older.

In most cases, damage outside of the impact area is cosmetic in nature. Depending on the magnitude and direction of the force on the house from the impact, and the age and quality of construction of the home, some structural damage can be present in these locations.

It is possible for older homes to crack due to a vehicle impacting a fixed object outside the home, such as a retaining wall, if the force from the impact is high enough. This impact can cause vibrations sufficient to cause some cosmetic damage to interior finish materials. It would be highly unlikely that structural damage would occur from this type of impact.

If you are in doubt about a vehicle impact, give us a call. We can provide a structural scope of repair and, if necessary, drawings for a building permit to repair the damage from the impact. We can also examine the interior and exterior of a building to help determine which damages were related to the vehicle impact, and which damages were pre-existing.

Visit our booth at the OIAA Provincial Conference on May 26, 2011 in Windsor!

Flexible Toilet Supply Fittings

By Peter Johnston, P. Eng.

Toilet Supply Connectors are short lengths of flexible hose that provide a quick and inexpensive means to connect a buildings water supply to a toilet tank. Unfortunately some cases of poor design, bad installation and material/ manufacturing deficiency have resulted in a reduction of the reliability of the connectors.

When these supply fittings fail, the consequences can be severe. Some recent testing measured the flow of water through one failed fitting at over 20 l/min. With such a high flow rate, considerable water damage can occur, even when a residence is unoccupied for only a short period.

The usual toilet supply fitting incorporates a plastic coupling nut that attaches to the ballcock, and a braided metallic or polymer jacket that surrounds and supports a polymer tube through which the water flows. A smaller metal nut is attached for the connection to the toilet shut off valve. Metallic crimp collars and inserts are used to attach the nuts to the braid.

The two most common failures observed are fractured coupling nuts and burst flexible hoses. Insert failures occur to a lessor degree.

The metallic components, namely the braid and inserts, typically fail as a result of damage from kinking, abnormal loading or corrosion mechanisms. If the braid fails, the support of the liner is lost and bursting of the fitting often follows. Evidence of corrosion and/or metallic braid damage is identifiable through macroscopic examination of the failed part.

Typically, coupling nuts fail due to a complete or partial fracture of the plastic at the base of the fitting. In the past, some coupling nut designs were prone to failure in this area due to a sharp corner at the transition from the base to the sides of the nut. Other coupling nut failures have been attributed to chemical attack, installation error, and material deficiencies.

Two prominent installation errors are; over tightening of a coupling nut, and the application of plumbers putty to seal the connector. Both are unnecessary, as the connector will seal when the plastic nut is hand tightened. Recent coupling nut designs have replaced wrench flats in an attempt to prevent the use of tools to tighten the nuts.

continued on page 3

The ‘Not-So-Secret’ Black Box

Jeff Udall, P. Eng.

Most modern vehicles have air bags that will deploy in the event of a crash. There are front air bags that are mounted in the steering wheel and the dash for the passenger, side air bags mounted in the side of the front seats just behind your arm, curtain air bags that come down from the roof of the vehicle to protect your head from the window, and a growing multitude of other places. Air bags are part of a ‘restraint system’ that supplements the good old seat belt. The seat belt is still the primary device that actually holds you in your seat when the car comes to a rapid stop on impact.

Deploying all these airbags takes a bit of smarts on the part of the onboard computers. If you bump the guy in front of you lightly, or hit a nasty speed bump, the last thing you need is for your car to suddenly fill up with explosive air bags. So how hard does the ‘crash’ need to be in order to deploy these things? And what if there is no passenger? Do those bags deploy as well? Should the side bags deploy when you are hit in the front – or visa versa? The computers are always monitoring what’s going on and if a certain level of deceleration in a certain direction is experienced by the circuitry, a quick algorithm is calculated and the process of pulling the trigger on the appropriate airbags is performed. This all happens very fast and is generally a very reliable system.

AFTER the onboard computers do their job of deploying the airbags and saving your life and giving little computer high-fives to each other, THEN they take on the secondary job of recording what happened. At this point, the computers change from being part of the restraint system to being crash data recorders. This information MAY be stored inside the vehicle and is accessible in SOME makes of vehicles. Should all the planets align, we are able to download the information into a computer and use it as part of a more in-depth accident reconstruction case. Various parameters are stored depending on the vehicle such as speed, seat belt status, and braking. Each of these parameters can provide insight into the actions of the drivers immediately before the crash and can help assist with determining liability.

The more current vehicles have more extensive information, while older vehicles have very little. At present time, only GM, Ford, and Chrysler vehicles are supported. Most other vehicles have the information but the tools required to obtain the data are proprietary and not available to the public. The rules are changing soon and the other vehicle manufacturers will be required to make this information available. This could provide a major change in the way accident reconstruction cases are handled.

These crash data recorders have been around for some time and a lot of people in the insurance industry are aware of what they can do. The general public is less aware of their presence since having a black box in the car might not be a good selling feature. But since the crash recorders often don’t provide useful information, and most vehicles are still not covered, a technician trained in the area should be consulted to determine if the data can be downloaded. Caskanette Udall Consulting Engineers has the tools and knowledge required to perform these downloads and use them as part of a more comprehensive reconstruction file.

Flexible Toilet Supply Fittings

continued from page 2

Plastics are not immune to all environments; in fact every plastic is subject to attack by incompatible chemicals. It is expected that coupling nuts will be resistant to the chemicals normally found in a bathroom. The use of a non-resistant plastic in the coupling nut application will result in degradation or hydrolysis.

Flexible connectors must meet the material and performance requirements set out in CSA B125 specifications. Approval to the CSA standard only means that tested fittings have met the requirements of the standard. If manufacturing facilities cannot continuously reproduce connectors of the same quality, failures will likely occur.

Finally, we have no conclusive means to predict which flexible connectors will fail in the future.

We suggest that a connector be changed if any of the following conditions are observed or if there is any doubt in its reliability:

1. Marked signs of corrosion, rust or damage in the metallic braid,
2. Yellow discoloration of the plastic coupling nut,
3. Kinking, stretching or abnormally tight bends in the flexible connector,
4. Leaking in or around the fitting,
5. The lack of a CSA insignia,
6. The lack of a manufacturer’s identifier,
7. The presence of tool marks, or
8. The presence of plumbers putty or sealant.

Ontario Bill 68 and the Repeal of the “Industrial Exemption”

It might not be known to many of you that for many years, non-licensed engineers have been allowed to perform engineering work in industrial settings under the umbrella of the “Industrial Exemption”. This will be ending soon due to a repeal of the “Industrial Exemption” which is to be enacted in Ontario Bill 68.

Licensed Professional Engineers will now be required to perform engineering work (as defined in the Professional Engineers Act) in the industrial setting

Wet Building Claims

Bob Caskanette, C.E.T.

After a building has been exposed to a significant volume of water, immediate action must be taken to mitigate the loss. Extracting water from the building is a critical first step. The building must then be effectively dried by using appropriate equipment and drying strategies. These steps must be taken as quickly as possible to avoid secondary damages, including mould growth. The damages need to be assessed early on and a detailed plan for repairs and restoration developed. The source and category of the water must also be evaluated early on to determine the extent of restoration. For example, a clean water source (i.e. burst pipe, Category 1) versus a dirty water source (i.e. sewer backup, Category 3) will need to be handled differently to ensure occupants of the building are not exposed to harmful pathogens which could lead to adverse health effects.

Properly drying out a building is a skilled and calculated effort and should only be undertaken by certified and competent restoration contractors, following the IICRC S-500 and S-520 guidelines, which are considered the Standards of Care for the water restoration and mould abatement industries respectively. The Science of Psychrometrics/Psychrometry is essential in understanding how to effectively achieve a drying goal/standard in as short a time period as possible. Following water extraction, dehumidification must be balanced with the rate of evaporation in a balanced drying system. The proper amount of equipment, ventilation and air circulation must be addressed and controlled from the start of the claim. Professional grade air movers and dehumidifiers only should be used. Temperature, relative humidity, dew point and grains per pound must be constantly monitored/calculated and evaluated. A psychrometric calculator should be a critical tool of any good building restorer. Inspection kits and various meters (penetrating and non-penetrating moisture meters, thermal hygrometers, carpet probes, etc.) should be utilized to assist the contractor. The contractor will need to take accurate and detailed records from the beginning to the end of the project. Issues with electrical power supply and potential safety hazards must also be evaluated.

Some materials are more difficult to dry than others. For example, hardwood floors may require special consideration. However, if the restoration contractor responds to the claim quickly, most building materials, including tough to dry ones such as hardwood, can often be salvaged and properly dried in place.

If mould becomes an issue, containment should be addressed and the use of HEPA air scrubbers considered. Air scrubbers assist in providing negative air pressure within the containment zone(s) and filter harmful mould spores from the indoor environment. As always, we suggest retaining a qualified consultant to assist in developing a mould abatement protocol and carrying out proper testing strategies in the building. It is often wise to enlist the services of a consultant to provide guidance when contractors are facing difficulties drying a building, determining the source(s) of the water, when structural issues arise or product liability and/or subrogation may be required.

Recent Training

Our staff remains committed to on-going education. Staff have attended the following courses in the past few months:

Jeff :	Crash Data Retrieval Analysis
Bob :	Applied Structural Drying
Micheka :	Building Condition Assessment
	Electrical Fires & Explosions

Contact Us

519-745-5066
1-800-920-5854
www.caskanette.on.ca

Rene Caskanette
B.A.Sc., P.Eng
rene@caskanette.on.ca
519-489-2901

Jeff Udall
B.Sc., B. Eng., M.A.Sc., P.Eng
jeff@caskanette.on.ca
519-342-6491

Bob Caskanette
B.A.Sc., C.E.T., AMRT
bob@caskanette.on.ca
519-618-9044

Micheka Caskanette
B.A.Sc., P.Eng, CFEI
micheka@caskanette.on.ca
519-488-5454

Peter Johnston
P.Eng.
peter@caskanette.on.ca
519-745-5066

Gail Tomka
Office Manager
gail@caskanette.on.ca
519-745-5066

Caskanette Udall
Consulting Engineers

608-675 Queen Street S.
Kitchener, ON N2M 1A1