



Examining the Building Envelope Via Rope Access

By Marcio Mendes

Photo 1 – Mairead Walsh of Williams Engineering Canada (WEC) rappels from the Talisman Centre in Calgary, Alberta.

Investigating sections of any tall structure can, at times, be very difficult, especially when the areas that need to be investigated are behind a tight corner or are blocked by an obscure object. Many building investigations are still conducted using conventional means of access, such as scaffolding and swing stages; however, this can be quite costly for a building owner and sometimes impossible for the technician conducting the investigation to perform.

So what method of investigation are some building science professionals moving toward in order to better access sections of tall structures? The answer is rope access.

Rope access refers to the use of specialized equipment and techniques to reach areas of a building that conventional means of access simply don't allow for. Rope access is a fast, efficient, and—above all—safe method to reach difficult areas of any vertical structure that requires investigation. Rope access also allows admittance to areas of

a structure with minimum impact on the structure itself, its operations, and its tenants.

The method of using ropes to access difficult areas originated from caving and climbing activities. A rope access professional uses two rope lines: one working rope line and the other as a backup that acts as a safety precaution. There are a variety of smaller pieces of equipment that are used when performing building investigations; however, a full-body harness is a standard piece of equipment that must meet safety standards. A full-body harness is the safest piece of equipment that any technician can use, as it can provide full-body support and easy access to tools that are being used during any investigation,

as well as on-site control positioning and precision.

In addition to a full-body harness, tech-



Photo 3 – Mairead Walsh performs a building investigation of the Talisman Centre's unique tent-like structure while using rope access.

Photo 2 – Mairead Walsh stands atop the Talisman Centre in Calgary, Alberta, after climbing its exterior.



Photo 4 - Mairead Walsh anchors her rope access equipment to a structural member of the Talisman Centre while conducting an investigation of the building's unique tent-like structure.

Photo 5 - Mairead Walsh conducts an investigation on the Fish Creek Library in Calgary, Alberta.



Technicians also rely on fall arrest devices, which act as backup safety devices and are used to stop a fall, slide, or uncontrolled descent. Any tools used during an investigation are attached to the technician at all times, allowing easy access to anything he or she may need. Technicians attach rope to structural roof anchors, either temporary or permanent; they can also tie off to structural members if necessary.

Certified rope access technicians are knowledgeable and have a thorough understanding of this safe, versatile, and efficient method used to investigate a variety of structures. Williams Engineering Canada's (WEC) Mairead Walsh agrees. "As a certified Level 1 Society of Professional Rope Access Technicians (SPRAT) technician, I can climb up or rappel down to any location on a building to review windows, wall systems, curtain walls, or any areas where building envelope concerns are suspected. Not only has my certification allowed me to grow as a professional in the industry, but it also assures our clients that our understanding of building investigations goes beyond the usual conventional methods."

SPRAT Level 1 certification requires

technicians to take part in a week-long training course that includes theoretical and practical rope training. The final day of training requires technicians to complete an exam that covers theory and equipment knowledge, and to perform a series of practical rope maneuvers.

Rope access allows professionals at WEC to conduct a variety of complex investigations, including roof assessments of steep-slope roofs and unusual building shapes, such as pyramids and fabric tent structures, where conventional methods of access are not possible. A great example of this is the building investigation work that was performed on the Talisman Centre in Calgary, Alberta. Although the unique tent-like structure of the Talisman Centre presented challenges, WEC was able to conduct a complete investigation of the existing building while using the rope access method to determine an appropriate roof replacement strategy and provide advice on life cycle upgrades.

WEC was also challenged by the unique

design of the Fish Creek Library, also located in Calgary, Alberta. Retained by Marshall Tittmore Architects to provide structural, mechanical, electrical, and building envelope consulting services, which included roof consulting services, WEC provided services from the start of the project through to the proj-

ect's construction completion phase, including regular quality assurance site observations and site reports.

The services provided during construction proved to be challenging because of the unique pyramid shape of the building and the steep 45-degree angle of the nontraversable Kalzip metal standing-seam roof. The most effective manner of conducting the investigation on the roof was through modified rope access. The method of using rope allowed WEC technicians to conduct a thorough investigation and provide their clients and contractors with the appropriate information required to move forward with the replacement of the roof for the library.

The use of rope access will continue to grow and be utilized more in the future for various building investigations. "The areas that rope access technicians can reach with this method are almost infinite," says Walsh. "As the construction industry moves toward the use of rope access for roofing and glazing applications, we are able to carry out building envelope site reviews in any location."

It's an exciting time to be part of the engineering industry, and being able to provide this type of innovative service allows building science professionals to access and investigate sections of buildings that in the past have been at times difficult or impossible to reach. 

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Photo 6 - Mairead Walsh repels down the unique pyramid-like roof of the Fish Creek Library in Calgary, Alberta.