



GeoVerra surveyor in front of the Parliament building

## Location

Ottawa, Ontario

## Client

HOK-WSP joint venture (CENTRUS)

## Status

2017-present

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## Project Description

The rehabilitation of Centre Block represents the largest project in the history of Public Services and Procurement Canada. The project to restore and modernize Centre Block — which includes the House of Commons and Senate chambers, the Library of Parliament, offices for MPs and party leaders and the Peace Tower — is underway and will take the better part of a decade.

## Client Brief

CENTRUS, a joint venture of WSP Canada and HOK, contracted GeoVerra to provide ongoing survey and geospatial solutions for the multiyear Centre Block Rehabilitation (CBR) project. The formal work began in 2017.

Throughout the project, GeoVerra has helped find innovative solutions for the client's constant data capture demands, including new processes and integrated deliverables that showcase the vast potential uses of point cloud data in a project of this size and complexity. From analysis on verticality and plumbness of excavated walls for the geotechnical team, finding creative methods of scanning hard to reach areas such as the Carillonneur Belfry or demolished elevator shafts, to coordinating the vast campaign of close-range scanning of sculptural elements, GeoVerra has been integral to the efforts of the joint venture.

When it comes to building health monitoring and establishing the automated monitoring system, which will be in place for years to come, there are constant logistical challenges on site, including the physical design and installation of the stations and control points. GeoVerra coordinates with several stakeholders to ensure that the building health monitoring network is stable, reliable, and maintained for years to come. This is especially difficult given the reduced space in downtown Ottawa around the Parliament buildings and the ever-changing construction areas.

## Why GeoVerra?

Heritage building renovations are intricate endeavours in a category all their own — demanding specialized skills to preserve historical and cultural significance while meeting modern standards. When you consider the sheer scale of Centre Block’s needs, the scope of work seems nearly stratospheric!

With GeoVerra’s multidisciplinary approach, technical proficiency, attention to detail, and strong dedication to consistent effort, the project can be done...and done well.

GeoVerra’s role started with topographic mapping, followed by investigations — data collection to provide valuable insights and details to inform decision-making, planning, design, and construction processes.

“Our team introduced the precise deformation monitoring program for blasting and then later, laser scanning for 3D modelling,” says Robin Poot, GeoVerra project manager. “We also built 3D digital models from high resolution photogrammetry.”

To aid a project of this scale and significance, the client employs precise models of the site at each major stage — pre-demo, post-demo, and throughout the construction phase. GeoVerra is the essential provider for all scanning to create those models.

“We are trusted for our geodetic control solutions and confirmations,” says Poot.

Geodetic controls are accurately determined reference points with known geographic coordinates that provide a consistent and reliable framework for surveying, mapping, and geospatial data integration. They serve as a foundation for measuring and positioning with high accuracy, making sure different applications can work together smoothly and share information correctly. In a project with this kind of national significance, history, and impact — it’s absolutely critical.

“Before, the clients used a local coordinate system with one pillar on site,” explains Poot. “We brought in an advanced, larger-scale system and now they rely on us for those insights.”

One of GeoVerra’s high powered scanners measures within 10-15 micrometres. “It’s perfect for ultra-high resolution precision scanning for these important artifacts — to the point where you could actually refabricate it if you needed to,” says Poot.

With resources across the country, GeoVerra is also extraordinarily adaptable. In simplest terms, GeoVerra’s strength is its breadth and depth of professional surveying. From technology to experience to professionalism, all angles are covered.

Beyond the technical challenges, the myriad of stakeholders, partners, architects, and engineers calls for a consistent and effective collaborative process. This includes weekly meetings with all stakeholders, ad hoc requests, and being trusted to answer evolving questions and enhance accuracy.

As always, GeoVerra is creative in finding solutions for things that have never been done before. “We had to scan the 53 bells in the Peace Towers,” remembers Poot. “We were literally crawling around the bells, putting scanners on the magnets and placing them at different angles all around while trying to avoid the wires. It’s situations like that you wouldn’t do many other projects.”

### Primary Services

The services provided by GeoVerra include fieldwork and preliminary processing to build and maintain a digital twin of culturally significant structures and carvings of the Centre Block. Our team of experts provided scan-to-BIM (building information modeling) of the interior and exterior of Centre Block and high-precision, close range, laser scanning of culturally significant carvings.

Other work carried out by our dedicated seven-person survey team includes development, maintenance, and ongoing support for a multi-faceted structural health monitoring system. This system helps to determine any movement of the structure due to construction or base isolation activities.

### Outcome

As of early 2021, GeoVerra has established itself as an integral group in this multidisciplinary and complex project. We are relied upon to perform archeological and geotechnical investigations, construction as-built surveys, terrestrial BIM laser scanning of the entire Centre Block in pre-demo and post-demo states, close-range hand scanning of sculptural heritage elements, geo-referencing of existing BIM models, and of course, the building health monitoring campaign. The building health campaign, which is a massive project, includes the use of four automated monitoring total stations, digital levels, optical plummets, and the more than one hundred monitoring prisms that have been installed thus far onsite.