Location
Calgary and Rocky View County, AB

Client
ATCO

Project Background

The Northwest Calgary Connector (NWCC) project involved the installation of approximately 14 km of high pressure, sweet natural gas, large-diameter pipeline running in the City of Calgary, along the northwest leg of Stoney Trail within the Transportation Utility Corridor (TUC), northward on 85th street, and ending in Rocky View County. In addition, the project included the construction of four valve site facilities along the line.

ATCO originally partnered with GeoVerra (via Opus Stewart Weir) in 2017 to execute the topographic survey and preliminary planning scope of the NWCC project. This work extended into the collaboration and development of detailed design drawings for the project, including Issued for Construction (IFC) alignment sheets and crossing profile plans, through to the construction and as-built kick off in late 2020.

GeoVerra is currently completing the final post-construction as-built package delivery and final legal survey plan registrations to close the project in 2022.

Overview

- ATCO undertook an Urban Pipeline Replacement (UPR) Program to replace and relocate ATCO's high-pressure natural gas pipelines located in densely populated areas of Edmonton and Calgary into the TUC surrounding both cities.
- The NWCC project was part of the UPR Program and involved installing approximately 14 km of natural gas pipeline and four above-ground facilities in Calgary.
- GeoVerra provided start-to-finish surveying that addressed the unique challenges posed by the dense urban utility corridor and varying types of land tenures.

Why GeoVerra – Trusted, Responsive, Reliable Solutions

With decades in the industry, GeoVerra knows that each pipeline project comes with unique challenges. The NWCC project stood out due to the variety of land tenures and survey techniques that were required throughout the life of the project. With Geoverra's background knowledge of the project and previous successful projects, ATCO entrusted GeoVerra to meet these challenges.

There are many factors that contributed to the success of this project, such as:

- employing detailed project management and stakeholder relations to facilitate entry and enable crews to complete surveys;
- using more efficient and safer advanced technology to save resources and costs; and
- collaborating through regular communication with ATCO's construction team to develop and maintain positive relationships.

Primary Services

Land Access and Acquisition

Land tenure types along the NWCC route ranged from private urban and rural parcels, City of Calgary public works lands, Federal lands, Alberta TUC, and utility and/or corporately owned parcels. Individual ownership plans (IOPs), ministerial consent (MC) plans, consultation mapping, right of entry (ROE) plans, and several legal plans were created for the application of the proposed right-of-way (ROW) and workspace required within the variety of lands. Following completion of construction, GeoVerra was also responsible for the final legal survey, including posting and registration of the permanent ROW plans with Alberta Land Titles.

Design

GeoVerra worked closely with the engineering design team and horizontal directional drilling (HDD) contractor to create the IFC alignment sheets, detailed profile plans, and crossing typical for the project. Adding to this was the sheer density of urban utilities in the TUC requiring thorough investigation and collection of information using a variety of resources: electronic locates/sweeps, tracing water valves and hydrants, manually measuring manhole and storm drain inverts requiring traffic control, cross-referencing old city block plans, and interpolating from engineering as-built drawings. Several areas also required waterbody depth surveys to gather information impacting drill designs.

Construction and As-Built

Due to the successful collaboration through the planning and design scopes, GeoVerra was also awarded the survey contract for the construction and as-built phase of the NWCC project. For this scope, GeoVerra hand-picked field and data support teams, which worked closely with the ATCO construction team and pipeline contractor to execute the following services:

- Demarcate all approved accesses, work areas, and proposed ROW
- Demarcate all known and suspected buried facilities discovered during the design phase
- Support hydrovac activities to confirm depths and locations of buried facilities
- Layout of the proposed pipeline route and all design features on the ground, including HDD and valve site features
- Miscellaneous layouts and checks for the contractor to ensure a successful build of the pipeline and facilities

- Ensure design and regulatory standards are met, such as depth of cover, pipe alignment and proper pipe support
- Assist with various HDD and design changes requested by the construction team and/or contractor
- Attend daily inspector meetings, provide daily reporting, cost reporting, and progress updates,
- Simultaneously collect all pipe and material as-built data required by ATCO throughout the build

During pipeline construction, the as-built data was collected, quality controlled and compiled into a detailed spatial database using the latest software available. This was then used to create the survey as-built deliverables in an efficient and easy-to-use platform. In addition, high precision railway settlement monitoring for LRT and CPR crossings and geotechnical survey support for steep slopes were also required ad hoc during construction.

Advanced Technologies

Throughout the project, several advanced technologies were used, including unmanned aerial vehicle (UAV) ground surveys with fixed-wing drones over populated areas, robotic high-precision total stations, monitoring software, and laser scanners. This allowed GeoVerra's team to collect large amounts of pre-construction, railway monitoring, and as-built survey data in an automated fashion versus the conventional total station or RTK approach, which takes more time and resources. A point cloud dataset and interactive web portal was created for ATCO's construction team, allowing them to access pre-construction ground information with the click of a button and was also utilized for geotechnical analysis on several occasions.

Outcome

"GeoVerra received a 5-star rating from ATCO via the construction team. Combined with other major pipeline projects with ATCO, such as the Pembina Keephills Transmission Line (PKTL) Project and past UPR projects, the NWCC is the latest installment of GeoVerra's long-standing history of successful work and positive feedback with the ATCO Pipelines group." – Robyn Soroka, Project Manager, GeoVerra

"GeoVerra provided an outstanding service during the design and construction phases of the Northwest Calgary Connector Pipeline. The GeoVerra team was not only able to deliver their services with the highest standard, but they went above and beyond to ensure successful project delivery. Throughout the challenging pipeline construction phase, GeoVerra collaborated with the project team and was able to implement innovative solutions in a timely manner which played an important role in keeping the project construction moving. We appreciate GeoVerra's commitment to the operation and, thank the team for their dedication and hard work throughout this challenging pipeline project." – Ranjodh Soora, Project Engineer, ATCO

For more information on how GeoVerra can support your pipeline project, send us a note at www.geoverra.com/contact