

COMPETENCY PROFILE:

# SURVEY TECHNICIAN

## ROLE OVERVIEW

Survey technicians gather data to create detailed maps of the Earth's surface, including underground and underwater areas. They identify property boundaries, facilitate land development, and map land features. Their work involves placing markers and locating previous survey points, often working outdoors in various weather conditions. They document their findings in field notes, which are used to draft maps and charts detailing the land's physical characteristics.

Key responsibilities include operating survey instruments like total stations and GPS devices to measure distances, angles, and elevations. They are also involved in setting up equipment, keeping precise survey records, and helping draft maps and reports. Survey technicians conduct field surveys, delineate property boundaries, and engage with project stakeholders. Their contributions are vital to the success of surveying projects, ensuring data accuracy and integrity.

## ALSO KNOWN AS:

- Land Survey Technician
- Geomatics Technician
- Geospatial Technician
- Geodetic Survey Technologist
- Topographic Survey Technician

## NATIONAL OCCUPATIONAL CLASSIFICATION:

- 22213 – Land survey technicians and technologies

## EDUCATION AND EXPERIENCE

- A technical diploma in geomatics, civil engineering, engineering design, or drafting is required for starting a career in surveying. These programs offer specialized training in survey principles, using surveying instruments, data collection methods, and drafting basics, establishing a solid theoretical knowledge and foundation for practical skills.
- While optional, joining professional engineering technician regulatory bodies can enhance a career. Membership boosts credibility and professionalism and provides opportunities for continuous learning, professional development, and networking.
- Gaining real-world experience through internships, co-op placements, or entry-level positions is essential to provide exposure to the day-to-day challenges of surveying work, including conducting field operations, managing data, and utilizing contemporary technologies.
- The land surveying field is continually advancing with the introduction of new technologies and methodologies. Commitment to ongoing education is vital for staying current with the latest surveying tools, software, and techniques, often requiring engagement in additional training, workshops, and seminars offered by professional organizations or educational institutions.

## TECHNICAL



### Data Entry

Assists in processing, calculating, analyzing, and computing measurements obtained during field surveys.

- Seeks feedback from other technical specialists to confirm interpretations and ensure all conclusions are aligned with the project plan.
- Inputs data gathered from the site into a database.
- Organizes measurements, records, and various survey information to make the information accessible.
- Assists in preparing charts, drawings, plans, maps, documents, and records to represent the site surveyed accurately.
- Uses surveying equipment to collect and record measurements and calculations for proper site assessment.
- Keeps records, measurements, and other survey information systematically to enable more straightforward calculations and comparison of survey computations.

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### Data Analysis

Uses established statistical tools and techniques to analyze and interpret data, identifying trends, patterns, and opportunities that inform strategic decisions.

- Interprets and analyzes field notes and data collected to help determine plans for the site.
- Helps create precise drawings, charts, and plans that accurately represent the site.
- Examines drawings/maps/documents to ensure conformity amongst results.

- Prepares reports on observations, findings, and impacts to communicate conclusions to stakeholders, industry, government, or the public.
  - Identifies data inconsistencies, errors, or reliability to take appropriate action to remedy or recreate data.
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## **Equipment Operation**

Operates equipment using established processes to ensure outcomes are within allowable variances and maximizes safety and efficiency.

- Installs, configures, and operates precision equipment for measuring electronic distances.
  - Follows appropriate procedures to calibrate and recalibrate instruments and equipment to ensure accurate measurements and quality control.
  - Works with other technical staff to install equipment to monitor and gather data from a specific location
  - Uses different types of equipment to measure and chart the features of the earth's surface.
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## **Geographic Information Systems**

Uses geographic information systems (GIS) technology, equipment, or systems to apply geospatial analysis procedures to produce data layers, maps, tables, or reports.

- Reads and understands maps to properly orient and locate the correct site.
  - Uses geographical landmarks and calculations to chart distances and property boundaries.
  - Applies advanced analytical modelling, 3D rendering, and plot creation procedures to create visual representations of geospatial data.
  - Enters datasets into GIS or computer-assisted design (CAD) software to prepare layered maps at approximate scales, extensions, and orientations to effectively describe the data.
  - Maintains and organizes datasets in various coordinate systems, including latitude/longitude and Cartesian coordinates, for reporting and archival purposes.
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## **Geospatial Surveys**

Uses geospatial data and digital systems to map and analyze characteristics of the earth's surface to facilitate development activities.

- Utilizes manual techniques to create new map layers that adhere to specific survey specifications and requirements.
- Uses magnetometers and gravimeters to measure the spatial changes in the earth's magnetic and density properties to understand the extent of regional-scale geological structures.
- Prepares and deploys satellite positioning or drone equipment to collect survey data.
- Analyzes spatial measurements, latitude, longitude, and angles to compute trigonometric and other calculations to plot land features, contours, and areas to a specific scale.

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## Land Surveys

Completes different types of land surveys (boundary surveys, mortgage surveys, topographic surveys, etc.) to identify the physical features of the land and support boundary retracement, subdivision, and land development projects.

- Assists with the calculations, analysis, and processing of site measurement data.
- Operates survey instruments and computer equipment to measure distance, angles, elevations, and contours of the land.
- Interprets various plans, deeds, sketches, construction and architectural drawings, and maps to match the legal boundaries of the land.
- Assists in developing methods and procedures for conducting field surveys.
- Lays out subdivisions for rural and urban development to facilitate future development on the land.
- Records survey findings and measurements to accurately identify different properties' boundaries and physical features.



## Attention to Detail

Review completed work by monitoring and checking information, organizing tasks and resources efficiently, and assessing all areas involved in achieving an objective.

- Accurately completes documents and report logs to ensure safe and efficient operations.
- Provides accurate, consistent, and reliable measurements and calculations on all sites to ensure trustworthy results.
- Process survey field files to calculate road design, drainage, and structural information.
- Identifies any on-site discrepancies within the design data and gives feedback to project staff to ensure the project is updated as needed.

## Communication

Positively directs outcomes by delivering communication that better understands goals and objectives, captures interest, and gains support for immediate action.

- Distill essential site information into a clear, understandable form to communicate the most crucial aspects to team members of different backgrounds.
- Verbally conveys complex technical information accurately, clearly, and in plain language to communicate technical operations.
- Provides leadership with workplace reports to convey processes and procedures to tasks to remedy inaccuracies and redundancies.
- Prepares comprehensive reports that identify project objectives, scope, research findings, alternatives, and recommendations to create a defensible assessment report.

## Collaboration

Engages in professional collaborative efforts with other team members, including sharing information and expertise, utilizing input from others, and recognizing others' contributions to work towards a common goal.

- Works to establish good working relationships with junior and senior personnel to work as part of a team and assist others.
- Shares relevant and valuable knowledge, experience, or expertise to aid team members in accomplishing their objectives more efficiently or effectively.
- Works with other survey technicians and land surveyors to execute projects with all the necessary data and calculations.



### Regulatory Compliance and Health and Safety Procedure

Complies with all relevant regulations and policies to meet land survey standards. Adheres to and advocates specific workplace safe operating procedures and occupational health and safety requirements within a defined jurisdiction to ensure the health and safety of others.

- Reviews plan for completeness and accuracy using industry standards of practice, including applicable provincial land surveying manual of standard practice, industry licensing requirements, provincial and municipal regulations, industry licensing requirements, and land title registration requirements.
- Wears appropriate personal and protective (PPE) for the environment to take steps to mitigate injuries and minimize risk.
- Operates all instruments and workplace equipment in a manner that ensures their safety.
- Identifies risk factors associated with the activity to devise appropriate and responsible safe practices to ensure the health and safety of all parties.

*This profile is a living document. If you have any feedback or would like to help us improve the profile, please reach out to [research@eco.ca](mailto:research@eco.ca).*