



WORLD CONSTRUCTION CHAMPIONSHIP

Qualification criteria for applicants in the team nomination "Surveying Engineer"

APPLICANTS

Currently employed specialists.

TEAM MEMBERS

2 specialists.

COUNTRIES

Russia,
Kazakhstan,
Kyrgyzstan,
Uzbekistan,
Tajikistan,
Belarus,
Armenia,
Azerbaijan,
Moldova,
Turkmenistan,
Turkey.

RELEVANT JOB TITLES, PROFESSIONS

Surveyor, Lead Surveyor, Senior Surveyor, Surveying Engineer, Chief Specialist in Engineering Surveying, Senior Topographer, Land Surveyor, Lead Mine Surveyor (Construction), Senior Mine Surveyor (Construction), Lead Specialist (integrated or by type of engineering surveying), Chief Specialist (integrated or by type of engineering surveying).

EDUCATION AND WORK EXPERIENCE REQUIREMENTS

- Related secondary education (specialist mid-level training programmes) and at least 3 years of work experience in the position held in the following specialisations: "Applied geodesy", "Land management", "Mine surveying", "Aerial photo-geodesy", "Architecture", "Construction techniques and technologies".
- Related higher education (Bachelor's, Specialist, and Master's programmes) and at least one year of work experience in the position held in the following specialisations: "Applied geodesy", "Geodesy and remote sensing", "Land management and cadastre", "Urban planning", "Cartography and geoinformatics", "Construction".
- Higher education (other than related one) — Bachelor's, Specialist, Master's programmes, and additional vocational education — vocational retraining programmes in geodesy, mine surveying, geodetic surveying.
Additional vocational education — qualification upgrading programmes in engineering geodetic surveys to be completed at least once every five years.

SKILLS REQUIREMENTS

- Use the technical and regulatory documentation related to geodetic surveying to plan and organise the execution of a particular type of surveying work.
- Analyse and evaluate the information required to plan geodetic surveys and to set and solve professional tasks in the field of geodetic surveying.
- Choose the most appropriate surveying techniques and tools.
- Use modern surveying technology in engineering surveys and geodetic support of construction and operation of buildings and engineering structures.
- Carry out geodetic engineering work in engineering surveys for the design, construction, and monitoring of engineering structures.
- Conduct a topographical survey to create survey plans, including the surveying of underground utilities.
- Create digital terrain models.
- Process and equalise the observations of a levelling course and evaluate the accuracy of its construction.
- Apply methodologies and software to equalise geodetic and levelling networks.
- Evaluate the accuracy of the determination of the planimetric and altitude positions of geodetic points based on the alignment of materials.
- Analyse observations of vertical angles and zenith distances at a survey point, and evaluate the accuracy of the observations.
- Make angular observations, linear measurements, and satellite determinations in the production of topographic surveys.
- Transform coordinate systems in accordance with the technical specifications.
- Evaluate the accuracy of geodetic measurements at a (geodetic) point.
- Use software to process satellite determinations and generate tacheometric surveys.
- Use software to create electronic engineering topographic plans and terrain models to provide geodetic information systems for urban planning activities.
- Collect, systematise, and analyse information on the topographic and geodetic coverage of the work area.
- Work with software and databases to record, analyse, and systematise engineering and geodetic surveying results.
- Prepare data for the calculation of the labour and resources required to carry out the geodetic survey, based on the customer's terms of reference.
- Allocate tasks for geodetic engineering work among individual participants.
- Use all applicable surveying instruments and tools.
- Use the established standards and formats for engineering and survey documentation.
- Ensure compliance with health and safety requirements when working in the field.
- Demonstrate ability to work with IFC formats and formats required to populate the digital information model in the 3D execution section.

KNOWLEDGE REQUIREMENTS

- Regulations on geodetic engineering.
- Regulations governing the planning of satellite determinations of coordinates and elevation of points on the earth's surface.
- Regulations regarding quality control of geodetic surveying works.
- Traditional and modern geodetic surveying methods and techniques.

- Methods and techniques for constructing geodetic networks and determining the coordinates of individual points.
- Knowledge on how the instruments are designed and operate and methods for the verification of instruments and tools for geodetic engineering work.
- Evaluation methods and quality indicators for geodetic engineering measurements.
- Methods of geodetic observation and measurement used for a particular type of geodetic engineering work.
- Methods of processing field geodetic survey results.
- Production methods and methods of mathematical processing of satellite determinations.
- Software used to process measurement data — tacheometric surveys, satellite measurements, laser scanning, geodetic levelling, levelling and levelling systems, and satellite determinations.
- Software for the creation of engineering topographic plans and mathematical terrain models in electronic form for information systems to support urban planning activities.
- Techniques for the mathematical processing of field observations in geometric and trigonometric levelling.
- The alignment of spatial coordinates of individual points and of geodetic network reference points obtained using satellite equipment and tacheometric surveying.
- Regulatory requirements for the content of reports on geodetic engineering work carried out.
- Technical regulations to ensure the safety of buildings and structures.
- Occupational health and safety requirements for field and desktop geodetic surveys.

JOB RESPONSIBILITY REQUIREMENTS

- Obtaining baseline geodetic data to support the construction and operation of engineering structures and major equipment.
- Determining ground and site elevation coordinates and structural elements of engineering structures by on-ground and satellite methods.
- Applying effective measurement methods and tools for field geodetic surveying.
- Processing the results of heterogeneous high-precision geodetic measurements; controlling and interpreting these results; assessing their quality.
- Performing a topographical survey and field processing of the topographical materials.
- Creating electronic engineering plans and a digital terrain model for geodetic information systems for urban planning activities.
- Obtaining and processing engineering and geodetic information on engineered structures and their elements in order to maintain the design geometry of the structure during its construction and operation and in the course of construction and installation work.
- Performing laser scanner measurements and comparing the design model with the point cloud.
- Analysing surface geometry.
- Preparing reports as per applicable requirements.

REQUIREMENTS FOR AVAILABILITY OF SPECIAL PERMITS AND DOCUMENTS

The applicant with work experience over five years must have certificates on qualification upgrading in engineering geodetic surveys. The upgrading training is to be completed at least once every five years.