



Euroopa Liit
Euroopa Sotsiaalfond



Eesti tuleviku heaks



ESF programm „Kutsete süsteemi arendamine“

OCCUPATIONAL STANDARD

Land survey technician, level 4

The occupational standard is a document, that describes the job and competence requirements, i.e. a set of skills, knowledge and attitudes required for successful job performance in a particular occupation.

Occupational standard of land survey technician, level 4 is the basis for the state curriculum of the vocational education as well as assessment of professional competencies.

Occupational qualification title	Estonian qualifications framework (EstQF) level
<i>Land survey technician, level 4</i>	<i>4</i>



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Part A JOB DESCRIPTION

A.1 Short description of job

Geodesy (*geodaisia* "division of the Earth" (in Greek)) is a science of determination of the shape and size of the planet Earth and parts of its surface as well as used survey methods, mathematical processing of survey results and depicting of the parts of the ground on level as maps, plans and profiles.

The main duty of the land surveyor is performance of geodetic operations on construction sites, planning and designing areas: first the survey works on the site and then processing, analyzing, interpretation and formulation of obtained data.

The land surveyor acts according to the profession in different areas: construction surveys, special engineering works, works related to higher geodesy, geodesy works. Based on the area of activity and formed traditions, the person working in geodesy area is called a land surveyor together with land management surveyor.

The vocations in the profession of geodesy are on four levels:

Land survey technician, level 4; land surveyor, level 5, land surveyor, level 6, land surveyor, level 7.

This occupational standard describes the professional competencies of the level 4 land survey technician.

Land survey technician, level 4 is a skilled worker who works in the companies and institutions related to geomatics area.

His main duty is performance of geodetic works on construction sites, geodetic and land readjustment works in cadastral units and planning and designing areas.

Land survey technician, level 4 performs common as well as new duties by selecting and using relevant tools and methods for their performance. He or she is responsible for high quality performance of one's work. The land survey technician needs guidance of the land surveyor or land management surveyor when performing works requiring more responsibility and more innovative approach.

A.2 Units

A.2.1 Survey works on the site

- 2.1.1 Preparing the survey works
- 2.1.2 Performing tacheometric survey works
- 2.1.3 Performing geodetic satellite survey works
- 2.1.4 Performing levelling work

A.2.2 Processing survey data

- 2.2.1 Revision and analysis of survey data
- 2.2.2 Performing geodetic calculations
- 2.2.3 Preparing geodetic drawings
- 2.2.4 Documenting survey data and calculation results

OPTIONAL COMPETENCES

A.2.3 Construction surveys

- 2.3.1 Performing setting-out
- 2.3.2 Performing execution and revision surveys

2.3.3 Geodetic survey of utility networks and documenting the results

A.2.4 Engineering and geodetic surveys

2.4.1 Establishing survey networks

2.4.2 Survey of the area

2.4.3 Geodetic survey of utility networks and documenting the results

2.4.4 Preparing a lay-out of the area

A.2.5 Cadastral survey works

2.5.1 Determining the cadastral unit boundaries

2.5.2 Situation survey

2.5.3 Preparing a plan of the cadastral unit

2.5.4 Determining the surface areas

2.5.5 Documenting a cadastral survey

Comparative list of units and tasks of geomatics profession is indicated in Annex 1 “Units and tasks”.

A.3 Working environment and specific aspects of work

Land survey technicians work in the office as well as in field works. Working time is flexible, depending on need, the sites should be surveyed also outside ordinary working time. The character of work is alternating – work in office alternates with field works.

The risk factors related to the working environment of the land survey technician are mainly caused by traffic and peculiarity of the buildings, construction and industrial sites and hence he or she must strictly follow the valid safety requirements.

In certain situations it may happen that when performing work tasks, the land surveyor must enter private properties, border of the state or other territories with limited access. In that case it is necessary to obtain a permission for staying and working in the specified territories.

A.4 Tools

The tools of the land survey technician in the office situation include common office equipment and professional software programs. In the field work, the land survey technician uses relevant instruments (e.g. tachometer, surveyor's level, GPS-survey instruments, etc) and, if needed, also the common hand tools like spade, saw, hammer, etc. In the field work sites, it is mandatory to wear the safety clothing (helmet, reflective jackets).

A.5 Personal characteristics necessary for this job: abilities and personality traits

The work of the land survey technician presumes logical thinking, visual memory, spatial imagination. Mathematical capability and concentration are also essential. Work of the land survey technician needs preciseness, conscientiousness, good ability to communicate and self-discipline.

For field works, a good physical condition and readiness to work in different weather conditions are recommended.

A.6 Occupational training

Usually the people with professional education and experience or the ones having passed the in-service training and obtained practical skill at working place work as level 4 land survey technicians.

A.7 Possible job titles

Land surveyor, technician-geodesist, land survey technician

Part B COMPETENCE REQUIREMENTS

B.1. The structure of the occupational qualification

Land survey technician, level 4 occupational standard consists of two mandatory (B.2.1-2.2) competences, transferable (B.2.6 – 2.10) competences and three optional competencies (B.2.3-2.5) of the vocation of land survey technician.

Certification of mandatory (B.2.1 and B.2.2), transferable (B.2.6 – 2.10) and at least one optional competence is required for acquiring of this vocation.

B.2 Competencies

OBLIGATORY COMPETENCES

B.2.1 Survey works on the site	EstQF level 4
<p><u>Performance indicators:</u></p> <ol style="list-style-type: none"> 1. Selects the survey tools based on the task, peculiarity of the surveyed site and preciseness requirements and makes sure that these are in working order before starting the works. Performs set up of the tools (checking, adjustment, entering of source data, etc). 2. Based on the prescribed task, performs tacheometric surveys (creates survey network, surveys the situation and relief and saves received results). 3. Performs geodetic satellite surveys based on prescribed tasks. 4. Performs technical levelling in the work group according to the prescribed task. 	
<p><u>Supporting knowledge:</u></p> <ol style="list-style-type: none"> a) Geodetic instruments, their operating principles b) Geodetic survey methods c) Basic knowledge about processing of geodetic survey data 	
<p><u>Assessment method(s):</u> Combined method – assessment based on documents and portfolio; if needed, a written test and/or oral questioning/interview.</p>	
B.2.2 Processing survey data	EstQF level 4
<p><u>Performance indicators:</u></p> <ol style="list-style-type: none"> 1. Checks and analyses survey data and makes sure their conformance to the prescribed preciseness requirements. 2. Makes geodetic calculations based on survey results. 3. Prepares geodetic drawings based on survey results. 4. Documents survey and calculation results and prepares technical reports. 	
<p><u>Supporting knowledge:</u></p> <ol style="list-style-type: none"> a) Use of CAD programmes in work b) Requirements for formulation of documentation of geodetic works 	
<p><u>Assessment method(s):</u> Combined method – assessment based on documents and portfolio; if needed, a written test and/or oral questioning/interview.</p>	



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OPTIONAL COMPETENCES

B.2.3 Performance of construction surveys	EstQF level 4
<p><u>Performance indicators:</u></p> <ol style="list-style-type: none"> 1. Performs setting-out works of the buildings according to the building design documentation and under guidance of the land surveyor. 2. Performs execution and revision survey of buildings according to the instructions and prescribed task. Prepares as-built drawings based on survey results. 3. Performs geodetic survey of utility networks and documents received survey results according to the requirements provided for by law. <p><u>Supporting knowledge:</u></p> <ol style="list-style-type: none"> a) Understanding and use of building design documentation b) Civil-engineering terminology c) Occupational safety requirements on site d) Methods of setting-out and execution surveys e) Basic knowledge about utility networks f) Geodetic survey methods of utility networks <p><u>Assessment method(s):</u> Combined method – assessment based on documents and portfolio; if needed, a written test and/or oral questioning/interview.</p>	
B.2.4 Performance of construction geodetic surveys	EstQF level 4
<p><u>Performance indicators:</u></p> <ol style="list-style-type: none"> 1. Creates, surveys and calculates the survey network according to prescribed preciseness requirements and task. 2. Surveys the situation and relief and saves received results based on established requirements. 3. Performs geodetic survey of utility networks and documents received survey results according to the established requirements. 4. Prepares layout of the area and other documents based on the survey results by considering the valid requirements. <p><u>Supporting knowledge:</u></p> <ol style="list-style-type: none"> a) Occupational safety requirements, incl risks caused by traffic b) Basic knowledge about utility networks c) Geodetic survey methods of utility networks d) Use of CAD programmes in work e) Formulation requirements of documentation of geodetic works <p><u>Assessment method(s):</u> Combined method – assessment based on documents and portfolio; if needed, a written test and/or oral questioning/interview.</p>	
B.2.5 Cadastral survey	EstQF level 4
<p><u>Performance indicators:</u></p> <ol style="list-style-type: none"> 1. Identifies, sets out, surveys and describes the borders of the cadastral unit under guidance of the land management surveyor based on requirements provided for by law. 2. Surveys the situation and saves received results based on requirements provided by law. 	

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<p>3. Prepares the layout of the cadastral unit and, if needed, other documents based on the survey data results under guidance of the land management surveyor based on the prescribed scale and requirements provided by law.</p> <p>4. Determines the general area of the cadastral unit and areas of the situation elements under guidance of the land management surveyor based on requirements provided by law.</p> <p>5. Submits the source data to the land management surveyor for preparation of the cadastral unit formation file.</p>
<p><u>Supporting knowledge:</u></p> <p>a) Occupational safety requirements, incl risks caused by traffic</p> <p>b) Land Cadastre Act and other legislative acts related to cadastral surveys.</p> <p>c) Instruments and equipment needed for cadastral survey works</p> <p>d) General knowledge about survey methods</p> <p>e) Use of CAD programmes in work</p>
<p><u>Assessment method(s):</u></p> <p>Combined method – assessment based on documents and portfolio; if needed, a written test and/or oral questioning/interview.</p>

TRANSFERSAL COMPETENCES OF LAND SURVEY TECHNICIAN

B.2.6 Following of quality in work	EstQF level 4
<p><u>Performance indicators:</u></p> <p>1. Level 4 land survey technician provides with his or her work service, which conforms to the agreed standards and quality requirements and adheres to the operational instruction, safety requirements, guidelines and procedures.</p> <p>2. Expresses himself or herself well in writing, all presented written materials are structured, logical and correct.</p>	
B.2.7 Planning of own work	EstQF level 4
<p><u>Performance indicators:</u></p> <p>1. Land survey technician is oriented to results and achievement of goals in his or her work, he or she works well and is dedicated to work. Ethical beliefs and values are important for him or her. He or she also behaves responsibly towards the environment and society.</p> <p>2. That level land survey technician plans time and activities beforehand, keeps the agreed schedule, deadlines and stages. His or her working style is systematic, methodical and orderly.</p> <p>3. Before making any decisions, the level 4 land survey technician analyses all relevant numeric and verbal information available for him or her, also all other sources of information.</p>	
B.2.8 Communication skills and team work	EstQF level 4
<p><u>Performance indicators:</u></p> <p>1. Creates good relations with clients as well as colleagues and communicates successfully with people from all levels.</p>	
B.2.9 Coping with problems	EstQF level 4
<p><u>Performance indicators:</u></p> <p>1. Land survey technician is adaptable, responds and adapts easily with changes, withstands stress and copes well with drawbacks. Works efficiently also in stressful situations and, if needed, can manage conflicts. Is able to take criticism understandably and learn from it.</p>	
B.2.10 Lifelong learning	EstQF level



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<ol style="list-style-type: none"> 1. Learns and obtains quickly new tasks, methods and techniques and approaches solving of situations and problems in innovative and creative manner. . 2. The level 4 land survey technician looks for proper learning opportunities and develops own working knowledge through constant professional development. 	
<p><u>Transfersal knowledge of the vocation of the land survey technician</u></p> <ol style="list-style-type: none"> a) legislation regulating the area b) Text and data processing programmes necessary for work c) Restrictions valid for specific survey sites (border areas, airports, railways, national defence land, etc) and related special permits and co-ordinations. 	
<p><u>Assessment method(s):</u> Transfersal competencies are appraised in an integrated manner together with appraisal of all other competencies presented in the professional standard.</p>	



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Part C

GENERAL INFORMATION AND ANNEXES

C.1 Information on the preparation and approval of the occupational standard, on the body awarding occupational qualifications, and reference to the location of the occupational standard in classifications	
1. Designation of the occupational standard in the register of occupational qualifications	13-21112014-3.1/5k
2. The occupational standard is compiled by:	Mairolt Kakko – OÜ REIB / Eesti Geodeetide Ühing Jaan Kallandi – OÜ Metricus / Eesti Geodeetide Ühing Jüri Randjärv – Eesti Maaülikool Karin Kollo – Maa-amet Toivo Tomingas – Maa-amet
3. The occupational standard is approved by	Building, Real estate and Geomatics Sectoral Council
4. No. of the decision of the Sectoral Council	33
5. Date of the decision of the Sectoral Council	21.11.2014
6. The occupational standard is valid until (date)	02.06.2018
7. Occupational standard version No	5
8. Reference to the Classification of Occupations (ISCO 08)	3112 Construction technicians
9. Reference to the level in the European Qualifications Framework (EQF)	4
C.2 Title of occupational qualification in foreign languages	
In English:	Land survey technician
In German:	Vermessungstechnik
In Russian:	землемер, техник-геодезист
In Finnish:	maanmittari, mittausteknikko
C.3 Annexes	
Annex 1.	"Units and tasks of geodesy area"

UNITS AND TASKS	Land survey technician, level 4	Land surveyor, level 5	Land surveyor, level 6	Land surveyor, level 7										
OBLIGATORY UNITS AND TASKS														
1. Surveying works on the site														
Preparation of surveying works	X	X	X	X										
Establishment of geodetic survey network	–	X	X	X										
Performing tacheometric surveying works	X	X	X	X										
Performing geodetic satellite surveying works	X	X	X	X										
Performing levelling work	X	X	X	X										
2. Processing survey data														
Revision and analysis of survey data	X	X	X	X										
Performing geodetic calculations	X	X	X	X										
Preparing geodetic drawings	X	X	X	X										
Documenting survey data and calculation results	X	X	X	X										
UNITS AND TASKS OF OPTIONAL COMPETENCIES														
3. Performance of construction surveys														
Establishment of projecting and actual construction network	–	Participates in supervision	X	X										
Performing geodetic setting-out works	Participates in supervision	Participates in supervision	X	X										
Performance of execution and revision surveys of buildings (including utility networks) and documenting the results	Participates in supervision	Participates in supervision	X	X										
4. Performance of geodetic surveys														
Establishing surveying networks	Participates in supervision	Participates in supervision	X	X										
Survey of the area	X	X	X	X										
Survey of utility networks and documenting the results	X	X	X	X										
Preparing a lay-out of the area	X	X	X	X										
Obtaining of necessary co-ordinations	–	–	X	X										
5. Cadastral survey														
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>UNITS AND TASKS</th> <th>Land survey technician, level 4</th> <th>Land surveyor, level 5</th> <th>Land surveyor, level 6</th> <th>Land surveyor, level 7</th> </tr> </thead> <tbody> <tr> <td colspan="5">5. Cadastral survey</td> </tr> </tbody> </table>					UNITS AND TASKS	Land survey technician, level 4	Land surveyor, level 5	Land surveyor, level 6	Land surveyor, level 7	5. Cadastral survey				
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Setting-out and survey of cadastral unit	X			
Situation survey	X			
Preparing a plan of the cadastral unit	Participates in supervision	–	–	–
Determining the surface areas	Participates in supervision			
Documenting a cadastral survey	X			
6. Performing engineering and geodetic surveys				
Architectural surveying of buildings and preparation of drawings		Participates in supervision	X	X
Surveying and preparation of more complicated facilities		Participates in supervision	X	X
Surveying works of historical buildings (including ruins)		Participates in supervision	X	X
Surveying works of deformations of buildings	–	Participates in supervision	X	X
Surveying and calculation of material volumes		X	X	X
Calibration and preparing technical specifications of specific facilities		Participates in supervision	X	X
Performing hydrographic surveying works		X	X	X
7. Higher geodesy works				
Designing of local geodetic networks			X	X
Designing of national geodetic networks			–	X
Building and reconstruction of local geodetic networks			X	X
Building and reconstruction of national geodetic networks	–	–	X	X
Erection of gravimetric networks			–	X
Conversions and determination of conversion parameters between the coordinate systems			X	X