OCCUPATIONAL QUALIFICATION STANDARD

Diploma Civil Engineer in Road Engineering, EstQF Level 7

An occupational qualification standard is a document which describes the set of skills, knowledge and attitudes, i.e. competence requirements, needed to successfully accomplish duties. Occupational qualification standards are used for compiling curricula and awarding qualifications.

Occupational title	Level of Estonian Qualifications Framework (EstQF)
Diploma Civil Engineer in Road Engineering, EstQF Level 7	7

Possible specialisation and titles on occupational certificate	
Specialisation	**Title on occupational qualification certificate**
Road construction and upkeep	Diploma Civil Engineer in Road Engineering, EstQF Level 7 Road construction and upkeep
Bridge construction and upkeep	Diploma Civil Engineer in Road Engineering, EstQF Level 7 Bridge construction and upkeep

Part A
DESCRIPTION OF WORK

A.1 Description of work

Civil engineers in road engineering act as specialists in the planning, design, construction, expansion, reconstruction and demolition of highways and streets, railroad embankments[1] and structures connected to roads.
A civil engineer in road engineering is tasked with developing technical solutions for road construction and the realisation of project solutions. In performing their professional duties, civil engineers in road engineering give consideration to social, economic, environmental, occupational health, occupational safety and ethical aspects, and work with specialists in related fields where necessary.
The following professional standards have been developed in the profession of civil engineer in road engineering:
- Civil Engineer in Road Engineering, Level 6
- Diploma Civil Engineer in Road Engineering, Level 7
- Chartered Civil Engineer in Road Engineering, Level 8

Civil engineers in road engineering at EQF Level 7 specialise in one of two areas:
1) Road construction and upkeep
2) Bridge construction[2] and upkeep
In addition to a specialisation, at least one of the following occupations must be chosen:
For road construction and upkeep:
a) Preparing road design documentation
b) Preparing traffic management documentation
c) Construction activity management (construction)
d) Construction management
e) Owner supervision
f) Road upkeep
g) Conducting expert analysis of road design
h) Conducting audits of traffic safety
i) Project management
For bridge construction[2] and upkeep:

a) Preparing bridge design documentation
b) Construction activity management (construction)
c) Construction management
d) Owner supervision
e) Bridge upkeep
f) Conducting expert analysis of bridge design projects
g) Conducting audits of bridges
h) Project management

Diploma Civil Engineer in Road Engineering, Level 7 is a specialist who is responsible for their own performance and that of others in the work group they manage.
The occupational qualification of Diploma Civil Engineer in Road Engineering, Level 7 entitles the bearer, on a statutory basis, to act as a competent person independently and at their own risk within the limits described as follows:

I MANAGEMENT OF (construction) ROAD CONSTRUCTION ACTIVITY, CONSTRUCTION MANAGEMENT AND ROAD UPKEEP
a) Highways which are expected to see up to 35,000 cars per day (the main route in the case of crossroads);
b) Streets which are expected to see up to 70,000 cars per day;
c) Road subgrades up to 20 m high or hollow ways up to 20 m deep;
d) Pavement repairs at railway crossings;
e) Railroad embankments without barriers.

II MANAGEMENT OF BRIDGE[2] CONSTRUCTION ACTIVITIES (construction), CONSTRUCTION MANAGEMENT AND BRIDGE UPKEEP
a) Crossovers with regular construction solutions (bridges, viaducts, gantries, wildlife crossings, etc.):
- That have a maximum height of 20 m above the surface of land or water;
- That have a single clear opening of a maximum of 100 m;
b) Culverts without barriers;
c) Tunnels for foot or road traffic with regular construction solutions in the first or second geotechnical category[3].

III PREPARING ROAD DESIGN DOCUMENTATION, OWNER SUPERVISION, PREPARING TRAFFIC MANAGEMENT DOCUMENTATION, CONDUCTING EXPERT ANALYSIS OF ROAD DESIGN AND LEADING DESIGN
a) Highways which are expected to see up to 35,000 cars per day (the main route in the case of crossroads);
b) Streets which are expected to see up to 70,000 cars per day;
c) All roads in wet areas;
d) Road subgrades up to 20 m high or hollow ways up to 20 m deep, incl. retaining walls;
e) Retaining walls up to 3 m high;
f) Roads without interchanges;
g) Pavement repairs at railway crossings;
h) Railroad embankments which can carry rolling stock with axle loads of up to 35 t;
i) Railway buildings with regular construction solutions which may have:
- sloped railroad subgrades up to 16 m high;
- railroad subgrades with retaining walls up to 9 m high;
- sloped railroad hollows up to 20 m deep;
j) railroad hollows with retaining walls up to 9 m deep;
k) Wetlands up to 6 m deep.

IV PREPARING BRIDGE DESIGN DOCUMENTATION[2], OWNER SUPERVISION AND DESIGN MANAGEMENT
a) Crossovers with regular construction solutions (bridges, viaducts, gantries, wildlife crossings, etc.):
- that have a maximum height of 12 m above the surface of land or water;
- That have a single clear opening of a maximum of 60 m;
b) Construction of bridge pillars up to the 2nd wet area;
c) Tunnels and culverts up to 15 m wide, 7.5 m below the red line and in the first or second geotechnical category[3];
d) Retaining walls without barriers;
e) Entrance and exit ramps up to 50 m before and after a bridge;

f) All railway bridges in accordance with the above-mentioned parameters.

V CONDUCTING EXPERT ANALYSIS OF BRIDGE[2] DESIGN AND CONDUCTING AUDITS OF BRIDGES
a) Bridges, viaducts, gantries, wildlife crossings, etc.:
- That have a maximum height of 20 m above the surface of land or water;
- That have a single clear opening of a maximum of 60 m;
b) Up to the 2nd wet area;
c) Tunnels and culverts without barriers;
d) All railway bridges in accordance with the above-mentioned parameters.

VI CONDUCTING AUDITS OF TRAFFIC SAFETY
Traffic safety auditing on highways that see up to 35,000 cars per day and streets that see up to 70,000 cars per day.

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[1] In this occupational qualification standard, railroad embankments are defined as railway and tramway embankments with their accompanying drainage systems, culverts, slopes, barriers, etc. This term does not include superstructures.
[2] In this occupational qualification standard, bridges are defined as bridges, viaducts, tunnels, wildlife crossings, gantries and culverts for any type of road (footpaths, bicycle paths, non-motorised transport routes, motorways and railways).
[3] as per EVS-NE 1997-1:2006

A.2 Tasks

A.2.1 Mandatory competences in the occupation of civil engineer in road engineering
1. Following the requirements of professional ethics
2. Professional self-improvement
3. Teamwork
4. Applying the principles of environmental protection and energy efficiency
5. Applying specialised knowledge to work
6. Digital competence and language skills

Specialised areas of work

Road construction and upkeep
A.2.2 Road construction and upkeep
1. Conducting and organising work within the limits of competence provided by the occupational qualification level
2. Verification of the high quality and compliance with traffic safety requirements of completed work and their parts
3. Determining the complex compliance/suitability of completed works
4. Arranging the transfer of completed works to the customer

Bridge construction and upkeep
A.2.3 Bridge construction and upkeep
1. Conducting and organising work within the limits of competence provided by the occupational qualification level
2. Quality control of completed works and their parts
3. Determining the complex compliance/suitability of completed works
4. Arranging the transfer of completed works to the customer

Elective areas of work

A.2.4 Preparing road design documentation
1. Compiling the road design project within the limits of competence provided by the occupational qualification level
2. Collecting and analysing source data
3. Participation in creating plans as an expert
4. Road geometry design
5. Choosing a type of pavement construction or designing pavement construction
6. Drainage system design
7. Traffic management design
8. Preparing and formulating design documentation
9. Collaboration with the design team
10. Construction cost estimation

11. Preparing demolition projects for roads
12. Compiling maintenance and operating instructions
13. Conducting designer's supervision
14. Conducting expert analysis of road design

A.2.5 Preparation of bridge design documentation
1. Compiling the bridge design project within the limits of competence provided by the occupational qualification level
2. Collecting and analysing source data
3. Participation in creating plans as an expert
4. Choosing, calculating and dimensioning the constructive scheme and type of bridge
5. Design of bridge entrance and exit ramps
6. Determining barrier solutions
7. Preparing and formulating the design documentation for the constructional part
8. Collaboration with the design team
9. Preparing demolition projects for structures
10. Construction cost estimation
11. Compiling maintenance and operating instructions
12. Conducting designer's supervision
13. Conducting expert analysis of bridge design projects
14. Conducting audits of bridges

A.2.6 Construction management (construction)
1. Management of construction activity within the limits of competence provided by the occupational qualification level
2. Compiling tenders
3. Planning construction activities
4. Planning construction resources
5. Management of subcontractor procurements and entry into contracts
6. Procurement of construction supplies
7. Organisation of construction activity and temporary traffic during construction work
8. Bridge upkeep (according to specialisation)
9. Road upkeep (according to specialisation)
10. Organising quality control and surveying
11. Preparing construction site transfer documentation
12. Arranging the transfer of the construction site

A.2.7 Construction management
1. Construction management within the limits of competence provided by the occupational qualification level
2. Preparing procurements and compiling procurement documentation
3. Compiling a schedule for construction work
4. Construction cost calculation
5. Design work preparation and organisation
6. Construction work preparation
7. Tender documentation preparation
8. Selecting contractors and preparing contracts
9. Coordinating the construction process as a representative of the customer or contractor
10. Transfer of construction site and taking it into use
11. Warranty period procedures

A.2.8 Owner supervision
1. Performing owner supervision within the limits of competence provided by the occupational qualification level
2. Developing a supervision programme
3. Verifying compliance of design project with requirements
4. Verifying compliance of construction work with contract
5. Quality control and assessment
6. Verifying compliance with safety requirements
7. Verifying required documentation
8. Accepting the building

9. Distribution of information
10. Making proposals
11. Conducting expert analysis of the design project within the limits of competence provided by the occupational qualification level and specialisation
12. Conducting audits of bridges (provided they have the relevant specialisation)

A.2.9 Road upkeep
1. Organising a patrol service and road condition monitoring
2. Organising road maintenance in summer and winter
3. Organising maintenance repairs

A.2.10 Bridge upkeep
1. Organising monitoring of the conditions of bridges and their parts
2. Organising maintenance and repair work

A.2.11 Preparing traffic management documentation
1. Analysing source data from traffic research and preparing research
2. Carrying out traffic research
3. Collecting and analysing the source data for the traffic organisation project
4. Preparing traffic management documentation
5. Modelling traffic management

A.2.12 Expert analysis of design project
1. Conducting expert analysis of the design project related to their specialisation within the limits of competence provided by the occupational qualification level
2. Familiarisation with the project, collecting and analysing source data
3. Determining the volumetric accuracy of the design project
4. Determining the compliance of project solutions with their purpose and requirements
5. Compiling an expert analysis report

A.2.13 Conducting audits of bridges
1. Conducting audits of buildings related to their specialisation within the limits of competence provided by the occupational qualification level
2. Familiarisation with the site, collecting and analysing source data
3. Organising additional studies and tests
4. Performing control calculations and additional measurements
5. Compiling an audit report

A.2.14 Conducting audits of traffic safety
1. Conducting audits of traffic safety within the limits of competence provided by the occupational qualification level
2. Familiarisation with the situation, collecting and analysing source data
3. Assessment of impact on traffic safety
4. Traffic safety auditing
5. Determining road safety
6. Road safety verification

A.2.15 Design management
1. Conducting design management activities within the limits of competence provided by the occupational qualification level
2. Preparing the design contract
3. Assembling the design team
4. Organising the exchange of information
5. Design coordination and quality management
6. Arranging designer’s supervision

A.3 Work environment and specific nature of work
A diploma civil engineer in road engineering works both indoors and on outdoor sites. The workload may be distributed unevenly.
A.4 Tools
In addition to conventional office equipment and software, special computing programmes and equipment (measuring and marking tools etc.) are used.
A.5 Personal qualities required for work: abilities and characteristics
Engineering requires analytical abilities, accuracy, spatial imagination, creativity, independence, decision-making, adaptability and communication, leadership and collaboration skills.
A.6 Professional preparation
A diploma engineer in road engineering at EQF Level 7 generally holds a Master's degree or an equivalent five-year integrated higher education diploma in road engineering. General higher education in construction is considered appropriate for the subspecialty of bridge construction and higher education related to railway construction for the corresponding subspecialty. In addition, vocational and professional work experience and in-service training are required in the prescribed amount according to the occupational qualification level being applied for. All requirements are specified in more detail in documentation on the procedure for granting the occupational qualification.
A.7 Most common occupational titles
Designer, person performing owner supervision, construction manager, site manager, consultant, project manager
A.8 Regulations governing profession
Building Code and its relevant implementing acts; Planning Act, Environmental Impact Assessment and Environmental Management System Act, Traffic Act, Railways Act and their relevant implementing acts; Other professional standards, guidelines and norms.

Part B
COMPETENCY REQUIREMENTS

B.1 Structure of occupation
The Diploma Civil Engineer in Road Engineering, Level 7 occupational qualification standard consists of one mandatory competence (B.2.1), two specialisation-related competences (B.2.2-B.2.3) and 12 optional competences (B.2.4-B.2.15). In order to obtain the qualification one mandatory competence, one specialisation-related competence and at least one optional competence related to the specialisation must be certified.

B.2 Competences

MANDATORY COMPETENCES

B.2.1 Mandatory competences of diploma engineer in road engineering	EstQF Level 7
1. Is guided in their work and occupational activities by generally accepted personal and occupational ethics (see Annex 1 – Engineer's professional ethics). Acts in accordance with agreements and takes responsibility for their decisions and actions. Respects and takes into account the best practice and standards underlying the behaviour of specialists in other occupational sectors. 2. Keeps up to date on technological changes and developments in the sector and contributes to the development of engineering culture directed at innovation and creativity, where possible. Maintains and develops occupational competence through constant self-improvement. Acquires new techniques and methodologies.	

3. Actively contributes to teamwork in a result-oriented manner with the goal of achieving the best possible result. Is helpful and open, sharing knowledge and experience with their colleagues. Perceives their role in the team and is able to work in a multidisciplinary environment. Leads and organises the work of working groups according to need and to the specific nature of the work: delegates tasks and responsibility, verifies implementation of agreements, motivates and advises colleagues and solves problems and conflicts that may arise in the work process. 4. Is guided by the principles of environmental preservation and sustainable development, keeps up to date on and implements the principles of energy efficiency in their activities. 5. Implements knowledge of engineering on the level necessary to accomplish duties that are within the limits of their competence and to find functioning and optimal solutions to any problems that may occur. Possesses and uses the necessary number of occupational engineering disciplines in accordance with their subspecialty in addition to the principles of natural sciences, incl. architecture, geodesy, construction geology, surface mechanics, construction physics, statics, dynamics, strength of materials, construction mechanics, material studies, concrete, wooden and stone constructions, hydraulics, hydrometry, statistics, road design and construction, general principles of traffic management and safety, construction work management and construction economics. 6. Uses a computer for information processing, communication, safety, content creation and problem-solving at the Independent user level on the Digital Competence Self-Assessment Scale (see Annex 2). Uses the specialty-specific software solutions, programmes and information technology tools necessary for work. Uses Estonian while working and compiling documents at least at the B2 level of language proficiency (see Annex 3) and at least one foreign language at the B1 level. Uses correct occupational terminology.

COMPETENTCES RELATED TO SPECIALISATION

In order to obtain the qualification one specialisation-related competence must be certified (B.2.2-B.2.3).

Road construction and upkeep	
B.2.2 Road construction and upkeep	**EstQF Level 7**
1. Leads and organises work associated with road construction and upkeep according to the competence limits of Diploma Civil Engineer in Road Engineering, Level 7 listed in the description of occupational qualification standard A.1. Bears in mind the primary task, best design and construction practice, the requirements of relevant legal acts and normative documents and agreements with the customer and partners. Takes into account other parties involved in the project and is aware of the impact of their own activities on their parts of the project. 2. Verifies the high quality of the work done during construction and its compliance with traffic safety requirements within the limits of their competence and according to the requirements established in the design documentation and other normative documents and instructions. 3. Is familiar with the specific nature of the activities of other parties involved in the project, understands the project as a whole, the place of their activities therein and the connections between the parties. Ensures that the complexity of the project as a whole and the work done on other parts of the project simultaneously are taken into account when work is carried out within the limits of their competence. 4. Plans their time and resources and does their best to transfer the completed works to the customer on time and in full. Formulates the necessary documentation according to specific requirements.	

Bridge construction and upkeep	
B.2.3 Bridge construction and upkeep	**EstQF Level 7**
1. Leads and organises work associated with bridge construction and upkeep according to the competence limits of Diploma Civil Engineer in Road Engineering, Level 7 listed in the description of occupational qualification standard A.1. Bears in mind the primary task, best design and construction practice, the requirements of relevant legal acts and normative documents and agreements with the customer and partners. Takes into account other parties involved in the project and is aware of the impact of their own activities on their parts of the project. 2. Verifies the high quality of the work done during construction within the limits of their competence and according to the requirements established in the design documentation and other normative documents and instructions. 3. Is familiar with the specific nature of the activities of other parties involved in the project, understands the project as a whole, the place of their activities therein and the connections between the parties. Ensures that the complexity	

of the construction project as a whole and the work done on other parts of the project simultaneously are taken into account when work is carried out within the limits of their competence. 4. Plans their time and resources and does their best to transfer the completed works to the customer on time and in full. Formulates the necessary documentation according to specific requirements.

OPTIONAL COMPETENCES

In order to obtain the qualification at least one optional competence related to the specialisation must be certified (B.2.4 - B.2.15)

B.2.4 Preparing road design documentation	**EstQF Level 7**
1. Compiles the road design project according to the competence limits of Diploma Civil Engineer in Road Engineering, Level 7 listed in the description of occupational qualification standard A.1. Completes the tasks allocated to them, working as a member of a team under the guidance and responsibility of a colleague with a higher occupational qualification level when preparing design documentation that exceeds the limits of their competence. 2. Collects and examines source data and analyses it. Determines applicable legislation, standards, rules and instruction materials and specifies their requirements for a specific structure. Determines and analyses the effects that impact structures based on the class of highway or type of street and the expected volume of traffic and load frequency with their projections. Prepares a programme of additional research, if necessary. 3. Collects and examines the source data of the plan and analyses it. Collaborates with other parties involved in the project in preparing a solution for the plan. 4. Prepares a plan and vertical solution for crossroads and road cross-sections in accordance with construction geology and other construction conditions. Prepares a variety of solutions, analyses them and chooses between them. Performs permeability and service-level calculations for crossroads and critical cross-sections. 5. Chooses a type of pavement construction or designs pavement construction based on the expected volume of traffic, weather conditions, geodetic substrate, optimal cost, etc. 6. Designs systems to direct water off roads and road constructions and watercourse fortifications based on water flow conditions. 7. Carries out traffic research based on the chosen methodology and research plan involving the relevant specialists. Examines the source task and data of compiling the traffic management project, analyses it and compiles a plan of action. Plans appropriate traffic management. Performs permeability control calculations and determines the service level, if necessary. Prepares and formulates the traffic management design documentation. Models traffic and analyses the results or orders this to be done, if necessary. 8. Designs or prepares specific parts (traffic management, car parks, new squares, road structures or accessories, landscaping, street lighting or plot distribution plan) in addition to the main solution and in accordance with the source task. Involves other specialists, if necessary. Prepares drawings and explanatory notes according to the design stage, explaining and justifying the choices made. Formulates and archives documentation. 9. Collaborates with other parties involved in the project, participates in design and expert assessment meetings, etc. 10. Calculates the amount of work done and the estimated cost of the project. 11. Prepares a road demolition project, if necessary. 12. Compiles instructions for the use and upkeep of roads, if necessary. 13. Performs supervision during construction activities and provides consultation on project-related issues. 14. Collects the source data necessary for expert assessment and analyses it. Verifies the integrity of the project and its compliance with legislation, standards and instruction materials. Performs the necessary control calculations and/or verifies the calculations and calculation schemes of the designer, assessing the validity of the technical solutions implemented. Assesses whether the safety and economy of the proposed solutions serve the intended purpose. Conducts expert analysis of design projects within the limits of their competence, participates in expert analysis meetings. Assesses the corrected project within the limits of their competence, if necessary.	
B.2.5 Preparation of bridge design documentation	**EstQF Level 7**
1. Compiles the bridge design project according to the competence limits of Diploma Civil Engineer in Road Engineering, Level 7 listed in the description of occupational qualification standard A.1. Completes the tasks allocated to them, working as a member of a team under the guidance and responsibility of a colleague with a higher occupational qualification level when preparing design documentation that exceeds the limits of their competence. 2. Collects and examines source data and analyses it. Determines applicable legislation, standards, rules and instruction materials and specifies their requirements for a specific structure. Determines and analyses the effects	

that have an impact on the structures (constant and variable load, load combination, service life, environmental impact, factors due to water flow in the watercourse, watercourse process projection, etc.). Prepares a programme of additional research, if necessary.
3. Collects and examines the source data of the plan and analyses it. Collaborates with other parties involved in the project in preparing a solution for the plan.
4. Selects a possible constructive scheme, type of facility (bridge or viaduct) and materials based on the source data. Calculates and dimensions supporting structures, bases of structures, retaining walls and foundations. Decides on the technology to be used to carry out the work.
5. Prepares bridge entrance and exit ramp design documentation on the road design project scale.
6. Determines barrier solutions based on source data (architecture, function and safety requirements of barrier, quality class, longevity, environmental impact, etc.) and the project as a whole.
7. Prepares and formulates the final construction design in accordance with the stage of design and applicable requirements. Involves other specialists, if necessary. Prepares sketches and explanatory notes explaining and justifying the choices made. Formulates and archives documentation.
8. Collaborates with the parties involved in the project, participates in design and expert assessment meetings, etc.
9. Prepares a demolition project for a structure, if necessary.
10. Calculates the amount of work done and the cost of construction.
11. Compiles instructions for the use and upkeep of structures, if necessary.
12. Performs supervision during construction activities and provides consultation on project-related issues.
13. Collects the source data necessary for expert assessment and analyses it. Verifies the integrity of the project and its compliance with legislation, standards and instruction materials. Performs the necessary control calculations and/or verifies the calculations and calculation schemes of the designer, assessing the validity of the technical solutions implemented. Assesses whether the safety and economy of the proposed solutions serve the intended purpose. Conducts expert analysis of design projects within the limits of their competence, participates in expert analysis meetings. Assesses the corrected project within the limits of their competence, if necessary.
14. Performs primary visual inspection, collects the necessary information (design documentation, surveys, research, photos, etc.). Compiles a programme for and estimates the cost of further research and audits based on the goal within the limits of their competence and carries out or organises the carrying out of the necessary research and tests. Performs necessary control calculations and additional measurements. Compiles an audit report within the limits of their competence and in accordance with relevant legislation.

B.2.6 Construction management (construction)	**EstQF Level 7**

1. Leads construction activities related to their specialisation according to the competence limits of Diploma Civil Engineer in Road Engineering, Level 7 listed in the description of occupational qualification standard A.1. Completes the tasks allocated to them, working as a member of a team under the guidance and responsibility of a colleague with a higher occupational qualification level when doing work that exceeds the limits of their competence.
2. Examines design and procurement documentation and other relevant materials. Estimates the capacity of the tender and requests a quote for the necessary materials, equipment and contractor work. Determines potential administrative costs, profits and the level of risk and provides a tender. Completes and formulates the final tender.
3. Enters into the construction contract. Compiles a plan for construction work (incl. work safety measures and a work schedule) and a goal budget. Commissions the work project if no such project has been prepared.
4. Supplies the construction site with the necessary resources (mechanisms, materials, workforce, energy, etc.). Determines the tasks and extent of responsibility of each member of the site management team.
5. Arranges for the procurement of the necessary building materials, equipment, means of transport, construction mechanisms and contractors and enters into contracts.
6. Orders or creates product sketches, ensuring their compliance with construction norms and quality requirements. Procures and/or orders the necessary construction products, organises their reception and storage.
7. Organises and coordinates construction work in accordance with the goal budget of the project. Ensures compliance with occupational health and safety requirements, traffic and environmental safety regulations and the general upkeep of the construction site.
8. Constantly ensures the proper documentation of construction work (incl. acts of work to be covered), the compliance of construction work with the contract and design and the fulfilment of construction norms and quality requirements. Conducts construction consultations, if necessary.
9. Organises condition monitoring or repairs for bridges and their parts (pillars, beams, bridge tiles, joints, support pieces, barriers, etc.) according to need, the condition requirements and their specialisation and within the limits of competence provided by the occupational qualification level.

10. Organises the following actions related to road upkeep according to their specialisation and within the limits of competence provided by the occupational qualification level: organising the monitoring needed to assess the condition of the road and the work of the patrol service that carries it out with the objective of acquiring the required amount of operative and adequate information; organising road maintenance work in both summer and winter and maintenance repairs according to the volume of traffic, amount of work and assessment of the need for maintenance repairs. 11. Organises quality control to assess compliance with construction norms and quality requirements and the performance of the necessary surveying work before the transfer of the construction site. 12. Compiles or orders the documentation necessary for the transfer of the construction site, incl. performance sketches, documentation for equipment and materials and instructions for maintenance and use. 13. Arranges for the transfer of the construction site.

B.2.7 Construction management	**EstQF Level 7**
1. Leads construction work related to their specialisation according to the competence limits of Diploma Civil Engineer in Road Engineering, Level 7 listed in the description of occupational qualification standard A.1. Completes the tasks allocated to them, working as a member of a team under the guidance and responsibility of a colleague with a higher occupational qualification level when doing work that exceeds the limits of their competence. 2. Examines primary conditions (construction research, technological solution, functional and use-related quality requirements, requirements of ensuring traffic safety, etc.) and prepares the procurement or compiles procurement documentation. 3. Compiles a schedule for construction work based on their technological processes. 4. Prepares a financial plan for construction work based on the estimated cost of construction, general and personalised cost calculations and time and payment schedules and taking into account the need for self-financing and the conditions presented in the procurement documentation. 5. Formulates the principles of carrying out the construction project and plans the organisational scheme of the project. Plans the necessary permit activities, prepares a schedule for carrying out the project and the division of project contractors. Compiles a design programme. 6. Determines the principles of organisation of construction work incl. labour methods and distribution. Compiles the organisational scheme of construction work. 7. Formulates the time- and cost-related goals of construction work and prepares tender documentation based on these goals. 8. Selects the necessary contractors and enters into contracts with them if corresponding agreements have been made. 9. Coordinates construction work as a representative of the customer: communicates with contractors, the design team and the customer, holds meetings and discussions, exchanges information between the parties involved, processes additional work due to changes made to the project during construction work and monitors the compliance of the construction work with the design. 10. Carries out inspections. Organises and leads work acceptance procedures, ensures the existence of the necessary use and maintenance instructions and other documentation and their transfer to the customer or user. 11. Carries out warranty-period activities for buildings.	

B.2.8 Owner supervision	**EstQF Level 7**
1. Supervises construction work related to their specialisation according to the competence limits of Diploma Civil Engineer in Road Engineering, Level 7 listed in the description of occupational qualification standard A.1. Completes the tasks allocated to them, working as a member of a team under the guidance and responsibility of a colleague with a higher occupational qualification level when doing work that exceeds the limits of their competence. 2. Compiles a programme of supervision procedures, bearing in mind relevant legislation. 3. Assesses the compliance of the design documentation forming the basis for construction with applicable legislation and the construction design on the basis of which a construction permit was issued. 4. Verifies the compliance of construction activities with the conditions and quality agreed upon between the construction contractor and owner/customer. 5. Verifies the compliance of structures or their parts with the design and the compliance of performance sketches and work to be covered with the requirements, design and reality. Is able to use building information modelling (BIM). 6. Verifies that traffic, environmental and occupational safety regulations and maintenance requirements are followed on construction sites. 7. Verifies the existence of construction documents drafted during construction activities and their proper and timely drafting, presentation and revision. Verifies the compliance of construction product or material documentation with	

requirements and the compliance of construction products or materials with requirements and the construction design according to the documents presented. 8. Assesses the level of completion of buildings and participates in the transfer of buildings or their parts. 9. Notifies the relevant persons or agencies of any deficiencies identified in the course of owner supervision. 10. Proposes additional quality control, measurements, tests and expert analyses of construction work, if necessary. 11. Collects source data related to their specialisation that is needed for expert assessment and analyses it. Verifies the integrity of the project and its compliance with legislation, standards and instruction materials. Performs the necessary control calculations and/or verifies the calculations and calculation schemes of the designer, assessing the validity of the technical solutions implemented. Assesses whether the safety and economy of the proposed solutions serve the intended purpose. Conducts expert analysis of design projects related to their specialisation within the limits of their competence, participates in expert analysis meetings. Assesses the corrected project within the limits of their competence, if necessary. 12. Performs a primary visual inspection of the construction site, provided they have the corresponding specialisation, collects necessary information (design documentation, surveys, research, photos, etc.). Compiles a programme for and estimates the cost of further research and audits based on the goal within the limits of their competence and carries out or organises the carrying out of the necessary research and tests. Performs necessary control calculations and additional measurements. Compiles an audit report related to their specialisation within the limits of their competence and in accordance with relevant legislation.
B.2.9 Road upkeep **EstQF Level 7**
1. Organises the monitoring needed to assess road condition and the work of a patrol service that carries it out according to weather conditions, traffic safety statistics, etc. Ensures that the information received during monitoring is operative and adequate. 2. Organises road maintenance work during both summer and winter, ensuring a result that complies with road condition requirements and the existence of the resources needed to carry out the work. 3. Organises the performance of road maintenance repairs based on the load on the road, the assessment of the need for maintenance repairs, the amount of work, etc.
B.2.10 Bridge upkeep **EstQF Level 7**
1. Organises condition monitoring of bridges and their parts (pillars, beams, bridge tiles, joints, support pieces, barriers, etc.). 2. Organises repairs for bridges and their parts according to condition requirements and need.
B.2.11 Preparing traffic management documentation **EstQF Level 7**
1. Examines the primary task and source data, selects the research methodology and compiles a research plan. Determines research area and selects necessary observation/measurement posts. Assesses land use, its changes and effect on traffic flow. 2. Assembles a research team and ensures that it is technically supplied as needed. Carries out the research. Processes, analyses and generalises the research results and compiles a report. 3. Examines the primary task and source data and compiles a plan of action. Collects additional materials and analyses them, if necessary. 4. Plans appropriate traffic management. Performs permeability control calculations and determines the service level, if necessary. Prepares and formulates the traffic management design documentation. 5. Models traffic and analyses the results or orders this to be done, if necessary.
B.2.12 Expert assessment of project **EstQF Level 7**
1. Conducts an expert assessment of design documentation related to their specialisation according to the competence limits of Diploma Civil Engineer in Road Engineering, Level 7 listed in the description of occupational qualification standard A.1. Completes the tasks allocated to them, working as a member of a team under the guidance and responsibility of a colleague with a higher occupational qualification level when doing work that exceeds the limits of their competence. 2. Examines the project, determines applicable legislation, standards, rules and instruction materials. Verifies the compliance of the project with the primary task and the associated normative and instruction materials. Verifies the compliance of the people compiling the project with competence requirements. 3. Verifies the integrity of the project and its compliance with legislation, standards and instruction materials. 4. Performs the necessary control calculations and/or verifies the calculations and calculation schemes of the designer, assessing the validity of the technical solutions implemented. Assesses whether the stability, safety and economy of the system or its parts presented in the project documentation serve the intended purpose.

Determines and analyses factors that have an impact on the building (e.g. constant and variable load, service life and environmental impact). 5. Conducts expert analysis of design projects in accordance with legal requirements within the limits of their competence, participates in expert analysis meetings. Assesses the corrected project within the limits of their competence, if necessary.	
B.2.13 Conducting audits of bridges	**EstQF Level 7**
1. Conducts audits of bridges according to the competence limits of Diploma Civil Engineer in Road Engineering, Level 7 listed in the description of occupational qualification standard A.1. Completes the tasks allocated to them, working as a member of a team under the guidance and responsibility of a colleague with a higher occupational qualification level when doing work that exceeds the limits of their competence. 2. Performs primary visual inspection, collects necessary information for the audit of buildings (design documentation, surveys, research, photos, etc.). 3. Compiles a programme for and estimates the cost of further research and audits based on the goal within the limits of their competence and carries out or organises the carrying out of the necessary research and tests. 4. Examines existing and procured documents and additional research reports, performs the necessary control calculations and additional measurements within the limits of their competence. 5. Compiles an audit report within the limits of their competence and in accordance with the goal of the audit and relevant legislation, wherein they assess whether the building is in accordance with its documentation and technically sound; for verification of use (whether using the building for its intended purpose and in the intended way is safe); and for documentation verification (whether documentation about the building and of its safe use and upkeep exists and meets the requirements). In the absence of such documents, determines and records the current situation and organises the drafting of the necessary documents.	
B.2.14 Conducting audits of traffic safety	**EstQF Level 7**
1. Conducts audits of traffic safety according to the competence limits of Diploma Civil Engineer in Road Engineering, Level 7 listed in the description of occupational qualification standard A.1. Completes the tasks allocated to them, working as a member of a team under the guidance and responsibility of a colleague with a higher occupational qualification level when doing work that exceeds the limits of their competence. 2. Examines the documents to be assessed, the traffic safety situation and the area of impact. Analyses the results obtained. 3. Projects and assesses impact on traffic safety as a result of the analysis. Design measures to improve traffic safety and performs a cost-benefit analysis of the options presented. Compiles a report and advises the developer of the document. 4. Examines either the design documentation or the nature of the realised solution depending on the audit stage, collecting additional material, if necessary. Assesses the safety level of deficiencies in the planned or realised solution. Makes proposals for the elimination or alleviation of the deficiencies discovered. Compiles a report, presents it to the customer, participates in the disclosure process and advises the customer. Analyses the actual behaviour of road users in the traffic safety auditing stage once the road has been put into use. 5. Divides the road network into crossroads and homogeneous sections of the road and determines their safety level. Selects objects of high priority as a member of a team, provides safety level analysis for them and plans mitigation measures. Compiles an assessment of the impact of the measures and advises the customer. 6. Verifies the compliance of the road network with traffic safety requirements. Collects additional data and analyses it, if necessary. Compiles a report as a result of the road network inspection.	
B.2.15 Design management	**EstQF Level 7**
1. Performs activities related to design and management according to the competence limits of Diploma Civil Engineer in Road Engineering, Level 7 listed in the description of occupational qualification standard A.1. 2. Collects and examines source data, determines applicable regulations, standards, rules and instruction materials. Estimates the amount and limits of work, prepares and clarifies the work schedule, if necessary, and prepares the design contract(s). 3. Assembles a design team, involving relevant contractors and specialists. 4. Organises and carries out design meetings, documents decisions and develops and establishes principles of information exchange. 5. Leads and monitors the design process and solutions and verifies the integrity of the design documentation and the compatibility of its parts. Controls data exchange and collaboration between the general construction and other specialties involved in the project. Documents changes and additional work that occur in the course of design.	

6. Verifies the compliance of solutions with the primary task and contract and the compatibility between individual parts of the design documentation. Formulates the design documentation, applies for approval from the relevant authorities and arranges the transfer of the project to the customer. Organises designer supervision during the construction process.

Part C
GENERAL INFORMATION AND ANNEXES

C.1 Information concerning compilation and certification of occupational qualification standard and reference to classification of occupations	
1. ID of occupational qualification standard in register of occupational qualifications	22-13022019-1.2/10k
2. Occupational qualification standard compiled by:	Daniel Lõhmus, OÜ Maanteed Heiki Meos, EstKonsult OÜ Martti Kiisa, Tallinna Tehnikakõrgkool Jüri Läll, Tallinna Teede AS Tiit Metsvahi, TalTech Tõnis Tagger, Maanteeamet Pavel Karev, Majandus- ja Kommunikatsiooniministeerium Ilmar Link, TPJ Inseneribüroo OÜ Tarvi Kliimask, GRK Infra AS
3. Occupational qualification standard approved by:	Architecture, Geomatics, Construction and Real Estate
4. No. of decision of Sectoral Council	20
5. Date of decision of Sectoral Council	13.02.2019
6. Occupational qualification standard valid until	07.02.2024
7. Occupational qualification standard version no.	10
8. Reference to International Standard Classification of Occupations (ISCO 08)	2142 Civil Engineers
9. Reference to European Qualifications Framework (EQF)	7
C.2 Occupational title in foreign language	
English:	Certified Civil Engineer in Road Engineering, EstQF Level 7
English:	Diploma Civil Engineer in Road Engineering, EstQF Level 7
C.3 Annexes	
Lisa 1 Engineer's Professional Ethics and Code Of Conduct	
Lisa 2 Scale of self-assessment in digital competence	
Lisa 3 Language skills level descriptions	