

OCCUPATIONAL QUALIFICATION STANDARD

Chartered Railway Engineer, EstQF Level 8

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.

The occupational qualification standard of a level 8 chartered railway engineer forms the basis for training curricula and the assessment of the competence of persons and comparison of qualifications.

Occupational title	Level of Estonian Qualifications Framework (EstQF)
Chartered Railway Engineer, EstQF Level 8	8

Possible specialisation and titles on occupational certificate	
Specialisation	Title on occupational qualification certificate
Construction and operation of railway rolling stock	Chartered Railway Engineer, EstQF Level 8 Construction and operation of railway rolling stock
Construction and operation of tracks	Chartered Railway Engineer, EstQF Level 8 Construction and operation of tracks
Management of railway traffic	Chartered Railway Engineer, EstQF Level 8 Management of railway traffic
Construction and operation of automatic railway equipment and communication technology	Chartered Railway Engineer, EstQF Level 8 Construction and operation of automatic railway equipment and communication technology
Planning railway transport	Chartered Railway Engineer, EstQF Level 8 Planning railway transport
Construction and operation of railway overhead contact systems	Chartered Railway Engineer, EstQF Level 8 Construction and operation of railway overhead contact systems

Part A DESCRIPTION OF WORK

<p>A.1 Description of work</p> <p>It is the job of railway engineers to plan, organise and ensure safe passenger and freight transport on railways. Railway engineers are technical and/or technological specialists or managers with higher education who work in companies and institutions that engage in railway infrastructure management, the provision of rail transport services and the operation of railway rolling stock (hereafter referred to as rolling stock) as well as the construction of railway facilities.</p> <p>Railway engineers are ready to work as part of an interdisciplinary team with railway construction, mechanical and transport engineers and logistics specialists.</p> <p>Chartered Railway Engineer, Level 8</p> <p>Chartered Railway Engineer, Level 8 is a high-level specialist and expert with extensive knowledge and experience who sees the field in its entirety. They apply their engineering knowledge, understanding and creativity in order to keep existing technologies and techniques in operation and improve them or develop new railway systems and technologies in their field of specialisation (construction incl. design, supervision and auditing, management of railway traffic, etc.).</p> <p>A chartered railway engineer independently works in situations that demand mastery, that are complex and undefined and that may require new strategic approaches.</p> <p>As a leader, they are responsible for the strategic activities of a unit or organisation.</p>

Chartered Railway Engineer, Level 8 specialises in a narrower field of work (specialty) and occupation (area) of their choice; see section A.2.

Related standards:

Railway Engineer, Level 6

Certified Railway Engineer, Level 7

See the descriptions and profiles of the occupational qualification levels of railway engineers in Annex 1.

A.2 Tasks

A.2.1 The improvement and development of railway infrastructure and rolling stock and ensuring synergy between them.

A.2.2 Management.

Specialised areas of work

A.2.3 Construction and operation of railway rolling stock

A.2.4 Management of railway traffic

A.2.5 Construction and operation of tracks

A.2.6 Construction and operation of automatic railway equipment and communication technology

A.2.7 Planning railway transport

A.2.8 Construction and operation of railway overhead contact systems

Elective areas of work

Construction and operation of railway rolling stock:

A.2.9 Construction and operation of wagons

A.2.10 Construction and operation of locomotives

A.2.11 Construction and operation of multiple units

Construction and operation of tracks:

A.2.12 Design and design control

A.2.13 Technical maintenance of tracks

A.2.14 Construction management in the construction of tracks

A.2.15 Supervision of the construction and operation of tracks

A.2.16 Technical maintenance of railway bridges

Construction and operation of automatic railway equipment and communication technology:

A.2.17 Design and design control

A.2.18 Construction management in the construction of automatic equipment and communication technology

A.2.19 Technical maintenance of communication and security devices

A.2.20 Supervision of the construction and operation of automatic equipment and communication technology

Construction and operation of railway overhead contact systems:

A.2.21 Design and design control

A.2.22 Construction management in the construction of railway overhead contact systems

A.2.23 Technical maintenance of railway overhead contact systems

A.2.24 Supervision of the construction and operation of railway overhead contact systems

A.3 Work environment and specific nature of work

Railway engineers work indoors and/or outdoors. They are required to work outside of normal working hours when necessary. They have to take traffic-related risks into account and exposure to noise, vibration and exhaust gases is possible. It is obligatory to comply with occupational health and safety and road safety requirements.

A.4 Tools

Railway engineers primarily use information communication devices (computers, phones and radio stations) and intelligent transport systems (information, reservation and payment systems etc.), office equipment, software (word processing, spreadsheets, online communication, etc.), special calculation and drawing programmes and control and measuring instruments in their work.

A.5 Personal qualities required for work: abilities and characteristics

The work requires accuracy, the logical thinking of an engineer, creativity, assertiveness, spatial awareness, the ability to analyse, make decisions, take responsibility and adapt as well as willingness to cooperate and communicate.

A.6 Professional preparation

Obtaining the qualification of a level 8 chartered railway engineer requires technical higher education, professional experience and the completion of further training.

A.7 Most common occupational titles

Development manager, project manager, railway traffic manager, railway transport manager, railway safety manager, production manager, regional manager, technologist, department or workshop manager, operation manager.

A.8 Regulations governing profession

Having an occupational qualification certificate allows one to act as a responsible specialist in the construction and maintenance of railway facilities in an area of activity recognised by the Ministry of Economic Affairs and Communications in accordance with the Building Code and the Railways Act.

Part B **COMPETENCY REQUIREMENTS**

B.1 Structure of occupation

For Chartered Railway Engineer, Level 8, competences B.2.1 and B.2.2, recurring competence B.25 and at least one competence from the specialisations B.2.3-B.2.8 must be certified. In addition, at least one elective competence must be certified in the following specialisations:

Construction and operation of railway rolling stock: at least one competence from B.2.9-B.2.11 must be certified.

Construction and operation of tracks: at least one competence from B.2.12-B.2.16 must be certified.

Construction and operation of automatic railway equipment and communication technology: at least one competence from B.2.17-B.2.20 must be certified.

Construction and operation of railway overhead contact systems: at least one competence from B.2.21-B.2.24 must be certified.

B.2 Competences

MANDATORY COMPETENCES

B.2.1 The improvement and development of railway infrastructure and rolling stock and ensuring synergy between them	EstQF Level 8
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Performance indicators:

1. solves the unique problems of the railway sector and completes engineering tasks, combining engineering information with relevant scientific, technical or technological principles;
2. independently analyses and synthesises new and difficult ideas relating to the occupational qualification: marketing solutions, technological services, management methods, etc.;
3. assesses the applicability of technologies in their field, taking into account user needs, the market situation and constraints;
4. designs, uses and develops complex devices and systems (e.g. automatic pilots), apparatus and technologies;
5. develops the control and operation technologies of railway facilities;
6. implements proposed solutions and participates in their assessment;
7. utilises appropriate information and communication technology tools and options;
8. complies with national and international legislation connected to railways and to national and international agreements when organising railway transport;
9. develops conditions for the maintenance and provision of railway infrastructure and safety requirements and monitors adherence to them;

10. determines the circumstances of incidents affecting railway safety, analyses them and adopts preventive measures.

Knowledge:

- 1) general science (mathematics, physics, informatics, logistics);
- 2) general engineering (engineering graphics, electrical engineering, metrology, foundations of automation, measuring technology);
- 3) the foundations of the functioning of the economy, regularities and regulations;
- 4) means and methods of production, design, automation, material processing technologies, devices and jigs, measuring technology used on railways;
- 5) the principles of project management, including the management of international projects.

B.2.2 Management

EstQF Level 8

Performance indicators:

1. manages teams and coordinates project activities using appropriate management techniques and systems;
2. plans resources and analyses their use on the basis of the goals of the company;
3. coordinates development work between companies;
4. prepares normative documents, reports and development plans of the field;
5. identifies the abilities and development needs of employees and plans their development, passes on professional skills and knowledge and coordinates the work of those being supervised based on
6. developments in the field;
7. implements the principles of quality, safety and environmental management of the organisation or unit, adjusting quality indicators.

Knowledge:

- 1) management (project management and research);
- 2) economics (microeconomics and macroeconomics on the level of the field);
- 3) quality (the ability to search for and compare analogues in related fields);
- 4) law (regional and international legislation related to transport, copyright protection).

COMPETENCES RELATED TO SPECIALISATION

At least one competence from the specialisations B.2.3-B.2.8 must be certified.

Construction and operation of railway rolling stock

B.2.3 Construction and operation of railway rolling stock

EstQF Level 8

Performance indicators:

1. plans, organises and develops the construction, technical maintenance and repair of railway rolling stock based on the project task;
2. develops new technologies and instructions for the construction, technical maintenance and repair of railway rolling stock;
3. develops solutions for the modernisation of railway rolling stock;
4. organises supervision, auditing and expert analyses in order to assess the compliance of the work with standards and requirements, adherence to construction technology, the documentation of activities and the impact of the construction project.

Construction and operation of tracks

B.2.4 Construction and operation of tracks

EstQF Level 8

Performance indicators:

1. plans and organises the design, construction and technical maintenance of tracks based on instructions;
2. organises the supervision of construction and owner supervision in order to assess compliance with standards and requirements by means of measurements and tests.

Management of railway traffic

B.2.5 Management of railway traffic	EstQF Level 7
Performance indicators: 1. plans and organises rail traffic and shunting along the route and at stations, using automatic rail traffic equipment and communication technology and complying with instructions and rules; 2. prepares train timetables and monitors the movement of trains according to the timetable; 3. audits and assesses the ensuring of railway safety and is responsible for the execution of road safety plans; 4. understands the laws, instructions and rules of the railway sector, including European Union legislation.	

Construction and operation of automatic railway equipment and communication technology	
B.2.6 Construction and operation of automatic railway equipment and communication technology	EstQF Level 8
Performance indicators: 1. plans and organises the design, construction and technical maintenance of automatic railway equipment and communication technology; 2. organises the quality control of construction and owner supervision in order to assess the compliance of the work with standards and requirements.	

Planning railway transport	
B.2.7 Planning railway transport	EstQF Level 8
Performance indicators: 1. develops instructions for the planning and coordination of the formation of rail traffic and transport timetables, schedules and freight transport; 2. prepares train timetables, the schedules of passenger trains and the rules and tariffs of freight transport on the basis of contracts with customers, conditions for the use of roads and restrictions; 3. plans the development of communication systems; 4. plans the logistics of railway transport on the basis of contracts with customers and the characteristics of transport; 5. audits and assesses road safety, including the impact of the construction project of security devices on road safety; 6. assesses the interaction between various parameters and their combined impact on traffic management, road safety and the environment.	

Construction and operation of railway overhead contact systems	
B.2.8 Construction and operation of railway overhead contact systems	EstQF Level 7
Performance indicators: 1. plans and organises the design, construction and technical maintenance of railway overhead contact systems; 2. organises the quality control of construction and owner supervision in order to assess compliance with standards and requirements by means of measurements and tests.	

OPTIONAL COMPETENCES

When specialising in the construction and operation of railway rolling stock it is obligatory to certify at least one of the competences from B.2.9-B.2.11.

When specialising in the construction and operation of tracks it is obligatory to certify at least one of the competences from B.2.12-B.2.16.

When specialising in the construction and operation of automatic railway equipment and communication technology it is obligatory to certify at least one of the competences from B.2.17-B.2.20.

When specialising in the construction and operation of railway overhead contact systems it is obligatory to certify at least one of the competences from B.2.21-B.2.24.

B.2.9 Construction and operation of wagons	EstQF Level 8
Performance indicators:	

1. plans, organises and develops the construction, technical maintenance and repair of wagons on the basis of the project task;
2. develops new technologies and instructions for the construction, technical maintenance and repair of wagons as well as modernisation solutions;
3. assesses compliance with requirements upon the introduction of wagons and the extension of their service life;
4. organises and manages the technical fitting of passenger carriages in accordance with the procedure established by the company;
5. develops methods of testing wagons and non-destructive inspection;
6. organises supervision, auditing and expert analyses in order to assess the compliance of the work with standards and requirements, adherence to construction technology, the documentation of activities and the impact of the construction project.

Knowledge:

- 1) the construction of wagons of different types;
- 2) the principles of the construction of wagons;
- 3) the principles of the technical maintenance and repair system of wagons;
- 4) repair means, methods and materials;
- 5) the principles of strength calculation for wagon constructions;
- 6) the methods of testing wagons and non-destructive inspection.

B.2.10 Construction and operation of locomotives

EstQF Level 8

Performance indicators:

1. plans, organises and develops the construction, technical maintenance and repair of locomotives;
2. develops new technologies and instructions for the construction, technical maintenance and repair of locomotives;
3. develops type test methods for new types of locomotives;
4. manages tests on the introduction of new types of locomotives and assesses their compliance with the requirements;
5. organises and manages the technical fitting of locomotives in accordance with the procedure established by the company;
6. develops new design features and modernisation solutions for locomotives;
7. develops methods of non-destructive inspection for locomotive parts;
8. organises supervision, auditing and expert analyses in order to assess the compliance of the work with standards and requirements, adherence to construction technology, the documentation of activities and the impact of the construction project.

Knowledge:

- 1) the principles of the construction of locomotives of different types;
- 2) the principles of the technical maintenance and repair system of locomotives;
- 3) repair means, methods and materials;
- 4) the principles of strength calculation for locomotive constructions;
- 5) the methods of testing locomotives and non-destructive inspection;
- 6) the requirements of new types of locomotives.

B.2.11 Construction and operation of multiple units

EstQF Level 8

Performance indicators:

1. plans, organises and develops the construction, technical maintenance and repair of multiple units based on the project task;
2. develops new technologies and instructions for the construction, technical maintenance and repair of multiple units;
3. develops type test methods for new types of multiple units;
4. develops the requirements of new multiple units;
5. manages tests on the introduction of new types of multiple units and assesses their compliance with the requirements;
6. develops solutions for the modernisation of multiple units;
7. develops methods of non-destructive inspection for the various parts of multiple units;
8. organises supervision, auditing and expert analyses in order to assess the compliance of the work with standards and requirements, adherence to construction technology, the documentation of activities and the impact of the construction project.

Knowledge:

- 1) the principles of the construction of multiple units of different types;
- 2) the principles of the technical maintenance and repair system of multiple units;
- 3) repair means, methods and materials;
- 4) the principles of strength calculation for the wagon constructions of multiple units;
- 5) the methods of testing multiple units and non-destructive inspection;
- 6) the technical requirements of new multiple units.

B.2.12 Design and design control connected to the construction and operation of tracks

EstQF Level 8

Performance indicators:

1. organises the collection and analysis of source data;
2. determines applicable regulations, standards, rules and instruction materials;
3. prepares plans and project documents;
4. coordinates the development of the different parts of the project, including the land allocation plan, layouts and vertical solutions of tracks;
5. designs crossings for vehicles and pedestrians, platforms, the embankment of the tracks, the superstructure, drainage channels, small bridges, culverts, etc.;
6. checks completed design documentation, assesses the impact of the prepared design on road safety and the environment, the interaction between various parameters and their combined impact on traffic management, road safety and the environment;
7. draws up the design, obtains confirmation from the authorities and submits it to the customer;
8. exercises the author's supervision of the design;
9. uses project management software, puts the information system into operation;
10. prepares instructions for design and calculation algorithms;
11. passes on knowledge regarding design and design control;
12. resolves topical issues, develops innovative solutions in the field of design.

Knowledge:

- 1) the distinctive features of the tracks and road facilities being designed;
- 2) a systemic overview of the foundations of the design of tracks and their connection with the functioning of the transport sector;
- 3) the types of track superstructure and embankments, the principles of their use, construction and technical maintenance;
- 4) the materials and devices of tracks; the technology, machines and devices of railway construction and economics;
- 5) electronic databases, design software and formatting requirements for drawings;
- 6) surveying work and field studies in construction geodesy and construction geology;
- 7) the principles of accounting;
- 8) the specific characteristics of the various fields of logistics and the main directions of the transport policy of Estonia and the European Union.

B.2.13 Technical maintenance of tracks

EstQF Level 8

Performance indicators:

1. plans and implements the system of verifying the compliance of tracks, facilities and devices with requirements and documenting it (quality control and risk assessment system);
2. plans the technical maintenance, repair and construction of tracks and facilities, thereby analysing the necessity of work, technical possibilities and optimal solutions, while taking into account life cycle costs;
3. coordinates the acquisition of confirmation necessary for the work, the appropriate documentation and transfer of the work;
4. monitors the ensuring of road and occupational safety, analyses incidents and instructs employees;
5. plans the implementation of optimal solutions in the procurement of work and materials, analyses the results of procurements;
6. prepares the documentation of technical maintenance and repair work as well as material procurement and tenders;
7. prepares instructions for the maintenance of tracks and devices, assigns tasks, instructs employees and provides professional training.

Knowledge:

- 1) the types of track superstructure and embankments, the principles of their use, repair and technical maintenance;

- 2) the technologies of the technical maintenance and repair of tracks, the materials and devices used;
- 3) the maintenance standards for tracks, facilities and devices; road and environmental safety requirements; quality assurance and control systems;
- 4) the organisation and technology of snow removal;
- 5) relevant laws, standards and instructions;
- 6) the principles of accounting and financial management.

B.2.14 Construction management in the construction of tracks

EstQF Level 8

Performance indicators:

1. plans the implementation of optimal solutions in the procurement of work and materials, organises procurements and the preparation of tenders, analyses the results of procurements;
2. prepares contracts for services and the implementation of the quality control system;
3. coordinates the acquisition of confirmation necessary for the work;
4. coordinates the preparation of the construction site and work, the logistics of materials and mechanisms, the execution of the work, quality control, project management and accounting;
5. monitors compliance with the requirements of the maintenance of the construction site and railway, environmental and occupational safety, analyses incidents and instructs employees;
6. organises construction meetings, inspections, measurements and tests, appropriate documentation and the transfer and receipt of work;
7. prepares instructions for the construction process and for use;
8. instructs employees and provides professional training.

Knowledge:

- 1) the types of track superstructure and embankments, the principles of their use, technical maintenance and construction;
- 2) the technologies of the technical maintenance and construction of tracks, the mechanisms, materials and devices used;
- 3) the maintenance standards for tracks, facilities and devices; road and environmental safety requirements; quality assurance and control systems;
- 4) relevant laws, standards and instructions, the principles of preparing a construction management project;
- 5) project management software;
- 6) the principles of accounting and financial management.

B.2.15 Supervision of the construction and operation of tracks

EstQF Level 8

Performance indicators:

1. checks the completeness and sufficiency of the construction project or the work, the quality and the suitability of the technology;
2. prepares the monitoring programme;
3. verifies whether the materials and products used and the devices meet the requirements and records the volumes and quality of work completed;
4. verifies whether the construction work and materials comply with the construction project, the agreed conditions and quality and informs the customer of any deviations;
5. verifies whether technical construction documents are completed properly and in time;
6. checks and accepts covered work and carries out inspections on parts of the facility;
7. participates in work meetings, the work of the acceptance committee of work or parts of work and granting authorisation;
8. checks instructions for use and other necessary documentation;
9. makes proposals for improving the quality of construction work and in connection with assessment, measurement, tests and expert analyses;
10. develops quality control systems and provides professional training.

Knowledge:

- 1) the rights and obligations of the person exercising owner supervision;
- 2) the quality requirements of construction work;
- 3) the requirements of a construction project;
- 4) the types of track superstructure and embankments, the principles of their use, technical maintenance and construction;

- 5) the technologies of the technical maintenance and construction of tracks, the mechanisms, materials and devices used;
- 6) the principles of measuring the parameters of tracks, devices and facilities and analysing them; requirements of documents;
- 7) the maintenance standards for tracks, facilities and devices; road and environmental safety requirements; quality assurance and control systems;
- 8) relevant laws, standards and instructions;
- 9) the mechanisms of legal regulation.

B.2.16 Technical maintenance of railway bridges

EstQF Level 8

Performance indicators:

1. plans and implements the system of verifying the compliance of railway bridges with requirements and documenting it (quality control and risk assessment system);
2. plans the technical maintenance, repair and construction of railway bridges, including work volumes, the schedule and the budget, thereby analysing the necessity of work, technical possibilities and optimal solutions, while taking into account life cycle costs;
3. prepares the maintenance plan for railway bridges;
4. plans and organises the verification of the compliance of railway bridges with requirements and the documentation of measurements and test results;
5. plans, manages and organises the technical maintenance and repair of railway bridges, including work volumes, technology, the schedule and the budget;
6. prepares or commissions the work project, obtains the confirmation and permits necessary for the work;
7. monitors the ensuring of safety and occupational health, analyses incidents and instructs employees;
8. coordinates the inspection of the work and materials, appropriate documentation and the transfer of work;
9. plans the implementation of optimal solutions in the procurement of work and materials, organises procurements and the preparation of tenders, analyses the results of procurements;
10. prepares the instructions for the maintenance of railway bridges, assigns tasks and instructs employees, provides professional training.

Knowledge:

- 1) the types of railway bridges, the principles of their use, repair and technical maintenance, the technologies, materials and devices used;
- 2) the technologies of the technical maintenance and repair of tracks, the materials and devices used;
- 3) the maintenance standards for railway bridges, tracks, facilities and devices; road and environmental safety requirements; quality assurance and control systems;
- 4) relevant laws, standards and instructions;
- 5) the requirements of construction projects and the documentation of work;
- 6) the principles of accounting and financial management.

B.2.17 Design and design control related to the construction and operation of automatic railway equipment and communication technology

EstQF Level 8

Performance indicators:

1. organises the collection and analysis of source data;
2. determines applicable regulations, standards, rules and instruction materials;
3. prepares project documents for automatic equipment and communication technology (including scheme plans, dependency tables and construction projects);
4. coordinates the development of the various parts of the project;
5. checks completed design documentation, assesses the impact of the prepared design on road safety and the environment, the interaction between various parameters and their combined impact on traffic management, road safety and the environment;
6. draws up the design, obtains confirmation from the authorities and submits it to the customer;
7. exercises the author's supervision of the design;
8. uses project management software, puts the information system into operation;
9. prepares instructions for design and calculation algorithms;
10. passes on knowledge regarding design and design control.

Knowledge:

- 1) the types and use of automatic equipment and communication technology systems being designed, the principles of their use and technical maintenance;
- 2) a systemic overview of the foundations of the design of automatic equipment and communication technology and their connection to the functioning of the transport sector;
- 3) the principles of the construction, use and technical maintenance of automatic equipment and communication technology;
- 4) the types of automatic equipment and communication technology; materials and devices;
- 5) the technology, machines, devices and economics of railway construction;
- 6) electronic databases, design software and formatting requirements for drawings;
- 7) the principles of electrical, road and environmental safety;
- 8) the principles of accounting and financial management;
- 9) the specific characteristics of the various fields of logistics and the main directions of the transport policy of Estonia and the European Union.

B.2.18 Construction management in the construction of automatic equipment and communication technology

EstQF Level 8

Performance indicators:

1. plans the implementation of optimal solutions in the procurement of work and materials, organises procurements and the preparation of tenders, analyses the results of procurements;
2. prepares contracts for services and the implementation of the quality control system;
3. coordinates the acquisition of confirmation necessary for the work;
4. coordinates the preparation of the construction site and work, the logistics of materials and mechanisms, the execution of the work, quality control, project management and accounting;
5. monitors compliance with the requirements of the maintenance of the construction site and railway, environmental and occupational safety, analyses incidents and instructs employees;
6. organises construction meetings, inspections, measurements and tests, appropriate documentation and the transfer and receipt of work;
7. prepares instructions for the construction process and for use;
8. instructs employees and provides professional training.

Knowledge:

- 1) the types of automatic equipment and communication technology and the principles of their use, construction and technical maintenance;
- 2) the technology of automatic equipment and communication technology; mechanisms, materials and devices used on site;
- 3) the maintenance standards for automatic equipment and communication technology, facilities and devices; road and environmental safety requirements; quality assurance and control systems;
- 4) relevant laws, standards and instructions;
- 5) the principles of preparing a construction management project;
- 6) project management software;
- 7) the principles of accounting and financial management.

B.2.19 Technical maintenance of communication and security devices

EstQF Level 8

Performance indicators:

1. plans and implements the system of verifying the compliance of automatic equipment and communication technology, facilities and devices with requirements and documenting them (quality control and risk assessment system);
2. plans the technical maintenance, repair and construction of automatic equipment and communication technology and facilities, thereby analysing the necessity of work, technical possibilities and optimal solutions, while taking into account life cycle costs;
3. coordinates the acquisition of confirmation necessary for the work, the appropriate documentation and transfer of the work;
4. monitors the ensuring of road and occupational safety, analyses incidents and instructs employees;
5. plans the implementation of optimal solutions in the procurement of work and materials, analyses the results of procurements;
6. prepares the documentation of technical maintenance and repair work as well as material procurement and tenders;

7. prepares instructions for the maintenance process of automatic equipment and communication technology and devices, assigns tasks, instructs employees and provides professional training.

Knowledge:

- 1) the types of automatic equipment and communication technology and the principles of their use, repair and technical maintenance;
- 2) the technologies of the technical maintenance and repair of automatic equipment and communication technology, the materials and devices used;
- 3) the maintenance standards for automatic equipment and communication technology, facilities and devices; road and environmental safety requirements; quality assurance and control systems;
- 4) relevant laws, standards and instructions;
- 5) the principles of accounting and financial management.

B.2.20 Supervision of the construction and operation of automatic equipment and communication technology

EstQF Level 8

Performance indicators:

1. checks the completeness and sufficiency of the construction project or description of overhead contact system work as well as the quality and the suitability of the technology;
2. prepares a monitoring programme and verifies whether electrical safety requirements are being adhered to;
3. verifies whether the materials and products used and the devices meet the requirements and records the volumes and quality of work completed;
4. verifies whether the construction work and materials comply with the construction project, the agreed conditions and quality and informs the customer of any deviations;
5. verifies whether technical construction documents are completed properly and in time;
6. checks and accepts covered work and carries out inspections on parts of the facility;
7. participates in work meetings and the work of the acceptance committee of work or parts of work;
8. checks instructions for use and other necessary documentation;
9. makes proposals for improving the quality of construction work and in connection with assessment, measurement, tests and expert analyses;
10. develops quality control systems and provides professional training.

Knowledge: the rights and obligations of the person exercising owner supervision:

- 1) the quality requirements of construction work;
- 2) the requirements of a construction project;
- 3) the types of communication and security devices and the principles of their use, technical maintenance and construction;
- 4) the technologies of the technical maintenance and construction of the overhead contact systems of communication and security devices, the mechanisms, materials and devices used;
- 5) the principles of measuring the parameters of communication and security devices and facilities and analysing them; the requirements for documents;
- 6) the maintenance standards for communication and security devices, facilities and devices; electrical, road and environmental safety requirements; quality assurance and control systems;
- 7) relevant laws, standards and instructions.

B.2.21 Design and design control related to the construction and operation of railway overhead contact systems

EstQF Level 8

Performance indicators:

1. organises the collection and analysis of source data;
2. determines applicable regulations, standards, rules and instruction materials;
3. prepares plans and project documents;
4. coordinates the development of the various parts of the construction project for overhead contact systems;
5. checks completed design documentation, assesses the impact of the prepared design on road safety and the environment, the interaction between various parameters and their combined impact on traffic management, road safety and the environment;
6. draws up the design, obtains confirmation from the authorities and submits it to the customer;
7. exercises the author's supervision of the design;
8. uses project management software, puts the information system into operation;
9. prepares instructions for design and calculation algorithms;

10. passes on knowledge regarding design and design control; 11. resolves topical issues, devises new directions for development and innovative solutions in the field of design.	
<p>Knowledge:</p> 1) the types and use of the overhead contact systems being designed; 2) a systemic overview of the foundations of the design of overhead contact systems and their connection to the functioning of the transport sector; 3) the principles of the construction, use and technical maintenance of overhead contact systems; 4) the types of overhead contact systems, materials and devices; 5) the technology, machines, devices and economics of the construction of overhead contact systems; 6) electronic databases, design software and formatting requirements for drawings; 7) surveying work and field studies in construction geodesy and construction geology; 8) the principles of accounting; 9) the specific characteristics of the various fields of logistics and the main directions of the transport policy of Estonia and the European Union.	
B.2.22 Construction management in the construction of overhead contact systems	EstQF Level 8
<p>Performance indicators:</p> 1. plans the implementation of optimal solutions in the procurement of work and materials, organises procurements and the preparation of tenders, analyses the results of procurements; 2. prepares contracts for services and the implementation of the quality control system; 3. coordinates the acquisition of confirmation necessary for the work; 4. coordinates the preparation of the construction site and work, the logistics of materials and mechanisms, the execution of the work, quality control, project management and accounting; 5. monitors compliance with the requirements of the maintenance of the construction site and railway, environmental and occupational safety, analyses incidents and instructs employees; 6. organises construction meetings, inspections, measurements and tests, appropriate documentation and the transfer and receipt of work; 7. prepares instructions for the construction process and for use; 8. instructs employees and provides professional training.	
<p>Knowledge:</p> 1) the types of overhead contact systems and the principles of their use, technical maintenance and construction; 2) the technologies of the technical maintenance and construction of overhead contact systems, the mechanisms, materials and devices used; 3) the maintenance standards for overhead contact systems, facilities and devices; road and environmental safety requirements; quality assurance and control systems; 4) relevant laws, standards and instructions; 5) the principles of preparing a construction management project; 6) project management software; 7) the principles of accounting and financial management.	
B.2.23 Technical maintenance of overhead contact systems	EstQF Level 8
<p>Performance indicators:</p> 1. organises the operation of the electrical devices of overhead contact systems; 2. plans and implements the system of verifying the compliance of overhead contact systems, facilities and devices with requirements and documenting them (quality control and risk assessment system); 3. plans the technical maintenance, repair and construction of overhead contact systems and facilities, thereby analysing the necessity of work, technical possibilities and optimal solutions, while taking into account life cycle costs; 4. coordinates the acquisition of confirmation necessary for the work, the appropriate documentation and transfer of the work; 5. monitors the ensuring of road and occupational safety, analyses incidents and instructs employees; 6. plans the implementation of optimal solutions in the procurement of work and materials, analyses the results of procurements; 7. prepares the documentation of technical maintenance and repair work as well as material procurement and tenders;	

8. prepares instructions for the maintenance process of overhead contact systems and devices, assigns tasks, instructs employees and provides professional training.

Knowledge:

- 1) the types of overhead contact systems and the principles of their use, repair and technical maintenance;
- 2) the technologies of the technical maintenance and repair of overhead contact systems, the materials and devices used;
- 3) the maintenance standards for overhead contact systems, facilities and devices; road and environmental safety requirements; quality assurance and control systems;
- 4) relevant laws, standards and instructions;
- 5) the principles of accounting and financial management.

B.2.24 Supervision of the construction and operation of railway overhead contact systems

EstQF Level 8

Performance indicators:

1. checks the completeness and sufficiency of the construction project or description of overhead contact system work as well as the quality and the suitability of the technology;
2. prepares a monitoring programme and verifies whether electrical safety requirements are being adhered to;
3. verifies whether the materials and products used and the devices meet the requirements and records the volumes and quality of work completed;
4. verifies whether the construction work and materials comply with the construction project, the agreed conditions and quality and informs the customer of any deviations;
5. verifies whether technical construction documents are completed properly and in time;
6. checks and accepts covered work and carries out inspections on parts of the facility;
7. participates in work meetings and the work of the acceptance committee of work or parts of work;
8. checks instructions for use and other necessary documentation;
9. makes proposals for improving the quality of construction work and in connection with assessment, measurement, tests and expert analyses;
10. develops quality control systems and provides professional training.

Knowledge:

- 1) the rights and obligations of the person exercising owner supervision;
- 2) the quality requirements of construction work;
- 3) the requirements of a construction project;
- 4) the types of the overhead contact systems and the principles of their use, technical maintenance and construction;
- 5) the technologies of the technical maintenance and construction of overhead contact systems, the mechanisms, materials and devices used;
- 6) the principles of measuring the parameters of overhead contact systems, devices and facilities and analysing them; requirements of documents;
- 7) the maintenance standards for overhead contact systems, facilities and devices; electrical, road and environmental safety requirements; quality assurance and control systems;
- 8) relevant laws, standards and instructions, mechanisms of legal regulation.

RECURRING COMPETENCES

B.2.25 Recurring competences of Chartered Railway Engineer, Level 8

EstQF Level 8

Performance indicators:

1. is guided in their activities by the engineer's professional ethics and code of conduct (see Annex 2 "Engineer's professional ethics and code of conduct");
2. acts responsibly and purposefully in accordance with occupational health and safety and road safety requirements;
3. takes part in teamwork, understands their role in the team and acts to achieve the best possible outcome collectively; creates a positive communication environment;
4. understands regulations (EU directives, standards, instructions, etc.) and institutions (e.g. the Technical Regulatory Authority and the European Union Agency for Railways) associated with the profession;
5. chooses a manner of communication corresponding to the target audience (colleagues, customers, specialists from a related field), provides information clearly, logically and in a manner understandable to the target audience;
6. keeps up to date with technological advances;

7. promotes their profession, supports the sustainable development of the field;
8. cooperates with institutions and cooperation networks associated with the profession;
9. maintains and improves their qualifications, keeps up to date on technological developments and makes proposals for innovative changes;
10. shares and mediates technical information, provides information clearly, logically and in a manner understandable to the target audience;
11. in their work, uses at least one foreign language at the B2 level (see Annex 3 'Language skills level descriptions');
12. uses a computer in their work according to the level required by the base modules and standard module 'Presentation' (see Annex 4 'Computer skills').

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	12-30062017-1.3/6k
2. Occupational qualification standard compiled by:	Arvo Smiltinš, Leonhard Weiss Baltic Holding OÜ Urmas Lükki, Edelaraudtee Infrastruktuuri AS kutsekomisjon Kristina Fuks-Kuus, Tehnilise Järelevalve Amet Rita Ojala, Edelaraudtee Infrastruktuuri AS Anto Looken, SA Raudteekutsed Tarvi Viisalu, AS Eesti Raudtee
3. Occupational qualification standard approved by:	Transport and Logistics
4. No. of decision of Sectoral Council	7
5. Date of decision of Sectoral Council	30.06.2017
6. Occupational qualification standard valid until	28.04.2022
7. Occupational qualification standard version no.	6
8. Reference to International Standard Classification of Occupations (ISCO 08)	2144 Mechanical Engineers
9. Reference to European Qualifications Framework (EQF)	8
C.2 Occupational title in foreign language	
English:	Chartered Railway Engineer, EstQF Level 8
Russian:	Уполномоченный инженер железнодорожного транспорта
C.3 Annexes	
Lisa 1 Descriptions and profiles of occupational qualification levels of railway engineers	
Lisa 2 Engineer's Professional Ethics and Code Of Conduct	
Lisa 3 Language skills level descriptions	
Lisa 4 Computer Skills	