

**ANNEX NO 3: TECHNICAL SPECIFICATION**

FOR OPEN COMPETITION

**“DETAILED TECHNICAL DESIGN REVIEW AND DESIGN EXPERTISE SERVICES FOR RAIL  
BALTICA IN ESTONIA”**

(IDENTIFICATION NO RBR 2019/14)



**Co-financed by the European Union**  
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## 1. Abbreviations and Terms

- 1.1. All abbreviations, designations, definitions and terms defined in the applicable laws, legislation, regulations, directives, TSIs, standards, rules, Technical specifications for Design Review and Design Expertise, Design Guidelines, other guidelines and documents of RBR/Client are used in this Technical Specification without modifications if not defined otherwise further. In this document where the context admits, the following words shall have the meaning assigned to them hereafter

### 1.1.1. Global administrative terminology

|                                     |  |
|-------------------------------------|--|
| Administrative review               | Review which shall be carried out just after receiving deliverable to check whether the deliverable provided is complete.  |
| Affected parties                    | State institutions, local government bodies, public and/or private enterprises, legal or private entities (persons) representing the owners and/or managers of the assets (networks and/or objects of power supply, gas, oil, water, drainage etc.) that are linked to the designed layout of Rail Baltica railway line and shall be considered during the provision of Design Services and Design Expertise Services. |
| Affected party Technical Conditions | Technical, connection conditions and requirements issued by an Affected party forming to be implemented by the Consultant as a part of the scope of the Design Services and by the Expert Service Provider as a part of the scope of the Design Expertise Services.  |
| Client                              | RB Rail AS (the principal in the Contract)   |
| Consultant                          | Master Design and Detail Technical Design Designer.  |
| Contract                            | The contract for provision of Design Review and Design Expertise Services concluded between the Client and the ESP. The Technical Specifications are annex to the Contract.  |
| Deliverable                         | Design Priority Section, a part of Design Priority Section, construction object or pack on construction objects.   |
| Design guidelines                   | Set of predefined and standardized technically and economically justified engineering and design solutions for Rail Baltica infrastructure to be applied at design, construction and operation phases of Rail Baltica Railway.   |
| Detailed Technical Design (DTD)     | Final stage of the design process in accordance with Country's construction legislation. In terms of Country's construction legislation, Detailed Technical Design corresponds to <b>Operational Building Design documentation</b> ("Tööprojekt" in Estonian) together with all requirements specified in Technical Specification for the Detailed Technical Design.   |
| Design Review                       | Activities required to check design deliverables conformity to the checklist provided in Annex 2 and Chapter 5 of this document  |
| Design Expertise                    | Activities required to check compliance of building design documentation or part thereof that forms a basis for construction with requirements according to Estonian legislation.  |
| DTD1                                | Design and design supervision services for the construction of the new line from Rapla to Pärnu  |
| DTD2                                | Design and design supervision services for the construction of the new line from Tallinn to Rapla  |
| DTD3                                | Design and design supervision services for the construction of the new line from Pärnu to Estonian/Latvian Border  |

|                               |  |
|-------------------------------|--|
| DTD technical specification   | Technical specification for Design and design supervision services with all associated Annexes   |
| Expert                        | Natural person, engineering professional with appropriate experience who is providing Design Review and Design Expertise services  |
| Expert service provider (ESP) | Service provider appointed to implement the Design Review and Design Expertise services  |
| Global project                | All activities undertaken by the Rail Baltica railway implementing parties in order to build, render operational and commercialize the Rail Baltica railway and related railway infrastructure in accordance with the agreed route, technical parameters and time schedule.  |
| Implementing bodies           | OÜ Rail Baltica Estonia  |
| Master Design (MD)            | <p>Consolidated approach of full design documentation package aimed towards detailed technical design by considering all legal requirements set out in national construction legislation and following the established design guidelines for the railway. The result of master design is a set of documents (incl. drawings in 3D model, ) which clearly shows the scope of the project, includes a situation plan with an accurate placement of the railway line, detailed track layout, main signaling, contact line, electrical network details, etc. The scope of these documents shall encompass the main details and the main requirements for precise idealization are clear.</p> <p>In terms of Country's construction legislation, Master Design corresponds to <b>Principal Design Documentation</b> ("Põhiprojekt" in Estonian) together with all requirements specified in Technical Specification for the Master Design..</p> |
| Preliminary design (PD)       | Completed pre-design stage, including spatial planning and environmental impact assessment studies, of Rail Baltica railway prepared in accordance with Country's national construction legislation and approved at the State level.   |
| Rail Baltica railway          | A new fast conventional double track electrified European standard gauge (1435 mm) railway line on the route from Tallinn through Pärnu - Riga - Panevėžys - Kaunas to Lithuanian - Polish border, with the connection of Kaunas - Vilnius.  |
| Railway infrastructure        | This has the same meaning as an identical term in the Directive 2012/34/EU of the European Parliament and of the Council of 21 November 2012 establishing a single European railway area (recast), as well as it includes freight and passenger terminals and infrastructure and rolling stock maintenance facilities and the ground underneath them and the airspace above them to the extent that the national legislation permits the ownership of the ground and the airspace.   |
| Technical Specification (TS)  | This document with all associated Annexes.   |
|                               |  |

### 1.1.2. Service specific terminology

|                               |   |
|-------------------------------|---|
| Bill of Quantities (BoQ)      | An itemized list of materials, parts, and labor together with their unit cost and description what is basis for cost calculation, required to construct, install, maintain, and/or repair the infrastructure. Classification system is described in the Detailed BIM Strategy.  |
| Building permit               | Construction permit issued by state authorities based on Country's construction legislation.  |
| Construction object           | Part of overall construction falling under the scope of Agreement that is defined as separate object for which an individual design package (covering all required documentation and approvals to receive a Building permit) is prepared allowing to have a separate construction (including construction tendering) and taking-over process in accordance with Country's construction legislation. |
| Country                       | Republic of Estonia   |
| Design Section (DS)           | Section(s) of overall Rail Baltica railway line falling under the scope of the Services.  |
| Design Priority Section (DPS) | Part of Design Section identified as separate Rail Baltica railway line section for the planning of the Design Services and management purposes (Annex 3)   |
| <b>EIA</b>                    | Environmental Impact Assessment.  |
|                               |   |
| Notified Body (NoBo)          | a body responsible for assessing the conformity or suitability for use of the interoperability constituents or for appraising the 'EC' procedure for verification of the subsystems.  |
|                               |   |
|                               |   |

## 2. Introduction to Rail Baltica

The Baltic countries Estonia, Latvia and Lithuania have historically been linked to the east-west railway transport axis using the 1520mm gauge railway system. Because of the existing historical and technical constraints, the existing rail system is incompatible with mainland European standards, thus there is a consensus that Estonia, Latvia and Lithuania need to be fully integrated into the wider European rail transport system. Currently there is no efficient 1435 mm gauge railway connection along the Warsaw-Kaunas-Riga-Tallinn axis, i.e. there are missing links or significant bottlenecks. Thus, there are no direct passenger or freight services along the railway axis as the existing infrastructure does not allow for competitive services compared to alternative modes of transport. Thus, the clear majority of the North-South freight is being transported by road transport and the overall accessibility in the region is low.

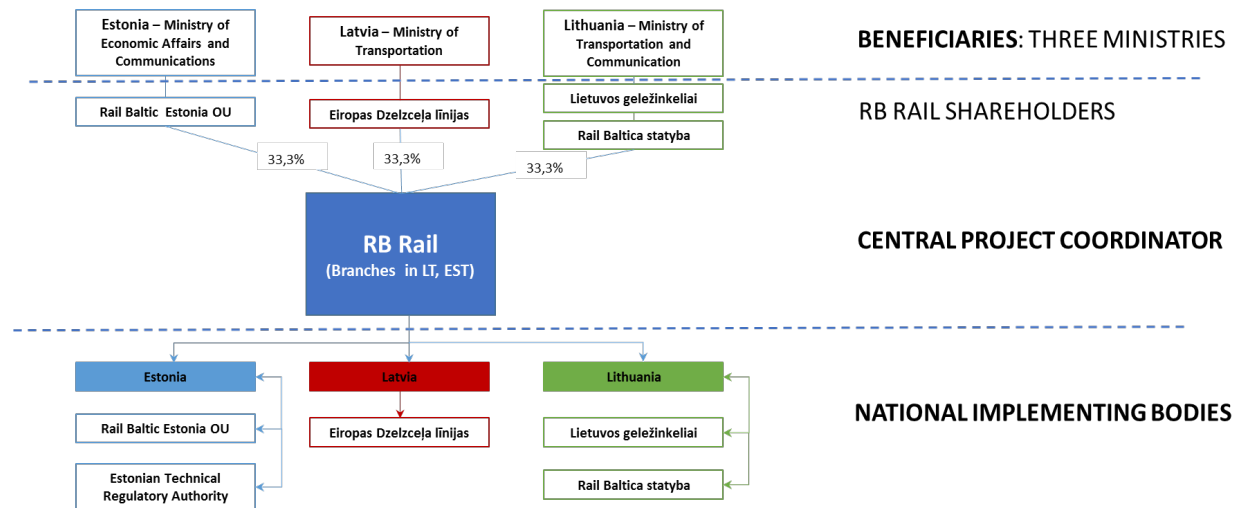
The ambitions of the Rail Baltica Global project (Global Project) are:

- to become a powerful catalyst for sustainable economic growth in the Baltic States;
- to set a new standard of passenger and freight mobility;
- to ensure a new economic corridor will emerge;
- sustainable employment and educational opportunities;
- an environmentally sustainable infrastructure;
- new opportunities for multimodal freight logistics development;
- new intermodal transport solutions for passengers;
- safety and performance improvements;
- a new value platform for digitalization and innovation;
- completion of Baltic integration in the European Union transport ecosystem.

Rail Baltica is already designed to become a part of the EU TEN-T North Sea – Baltic Core Network Corridor, which links Europe’s largest ports of Rotterdam, Hamburg and Antwerp – through the Netherlands, Belgium, Germany and Poland – with the three Baltic States, further connecting to Finland via the Gulf of Finland short sea shipping connections with a future fixed link possibility between Tallinn and Helsinki. Further northbound extension of this corridor shall pave the way for future connectivity also with the emerging Arctic corridor, especially in light of the lucrative prospects of the alternative Northern Circle maritime route development between Europe and Asia. Furthermore, the North Sea – Baltic Corridor crosses with the Baltic-Adriatic Corridor in Warsaw, paving the way for new supply chain development between the Baltic and Adriatic seas, connecting the Baltics with the hitherto inadequately accessible Southern European markets. In a similar fashion, Rail Baltica shall strengthen the synergies between North-South and West-East freight flows, creating new trans-shipment and logistics development opportunities along the Europe and Asia overland trade routes. The new Rail Baltica infrastructure would, therefore, not only put the Baltics firmly on the European rail logistics map, but also create massive opportunities for value creation along this infrastructure with such secondary economic benefits as commercial property development, revitalization of dilapidated urban areas, private spin-off investment, new business formation, technology transfer and innovation, tourism development and other catalytic effects. Rail Baltica aims to promote these effects from the early stages of the Global Project, learning from the key global success stories and benchmarks in this regard.

The Contracting authority RB Rail AS (RBR) was established by the Republics of Estonia, Latvia and Lithuania, via state-owned holding companies, to coordinate the development and construction of the fast-conventional standard gauge railway line on the North Sea – Baltic TEN-T Core Network Corridor (Rail Baltica II) linking three Baltic states with Poland and the rest of the EU.

The diagram below illustrates the shareholder and project governance structure of the Rail Baltica project.



RBR together with governments of Estonia, Latvia and Lithuania (represented by the ministries in charge of transport policy) have applied for the CEF co-financing in 2015, 2016 and 2017 (three applications in total). The applications were successful and INEA grants are available to support the Global Project expenses.

Rail Baltica is a joint project of three EU Member States – Estonia, Latvia and Lithuania – and concerns the building of a fast conventional double-track 1435 mm gauge electrified and ERTMS equipped mixed use railway line on the route from Tallinn through Pärnu (EE), Riga (LV), Panevėžys (LT), Kaunas (LT) to the Lithuania/Poland state border (including a Kaunas – Vilnius spur) with a design speed of 249km/h. In the longer term, the railway line could potentially be extended to include a fixed link between Helsinki and Tallinn, as well as integrate the railway link to Warsaw and beyond.

The expected core outcome of the Rail Baltica Global Project is a European gauge (1435mm) double-track railway line of almost 900 km in length meant for both passenger and freight transport and the required additional infrastructure (to ensure full operability of the railway). It will be interoperable with the TEN-T Network in the rest of Europe and competitive in terms of quality with other modes of transport in the region. The indicative timeline and phasing of the project implementation can be found here: <http://www.railbaltica.org/about-rail-baltica/project-timeline/>.

### 3. Technical Requirements for Design Review and Design Expertise

#### 3.1. Applicable legislations – Republic of Estonia.

- “Nõuded ehitusprojekti ekspertiisile” Majandus- ja taristuministri 08.06.2015 määrus nr 62;
- “Nõuded ehitusprojektile” RT I, 18.07.2015;
- “Ehitusseadustik” RT I, 19.03.2019,98;
- “Tee ehitusprojektile esitatavad nõuded” RT I, 03.07.2015,29;
- other applicable legislation acts and documents.

#### 3.2. General Information and scope of work

3.2.1. According to preliminary design 213 km of Railway in Estonia includes 52 railway bridges/viaducts, 24 ecoducts, 42 road crossings, 284 culverts and other structures which shall be taken into account respectively for every Design Priority Section. This amount of construction objects and Design Priority Sections is used only in the form of Detailed Financial proposal and shall not be treated as limiting and/or restricting the scope of Services. Tenderer shall take into account that actual number of total construction objects and structures may change during design process of Rail Baltica.

3.2.2. Design Review and Design Expertise service shall be carried out for the following design stages

- Master Design – Design Review and Design Expertise;
- Detailed Technical Design – Design Review.

3.2.3. Design Review

- ESP shall carry out the Design Review services for each deliverable in Master Design and Detailed Technical Design which are provided to ESP by Client;
- Design Review services minimum scope of work for each deliverable shall be provided according to Chapter 5. in this document;
- Design review reports shall be done in English;
- Client has a right to decide whether Design Review remarks provided by ESP shall be implemented or not.
- ESP shall use Design Review as an input basis for Design Expertise report
- BIM deliverables are not part of scope of work for Design Review Services

3.2.4. Design Expertise

- The Expert shall carry out Design Expertise services for every designed construction object that is required by Estonian legislation;
- Indicative list and amount of construction objects based on Rail Baltica Preliminary Design solutions are shown in DTD Technical Specification in Annex 3;
- Design Expertise report shall be done in English and Estonian language.

3.2.5. Period for the provision of the Design Review Services and Design Expertise Services is envisaged to last twenty-seven (27) months starting from the Signing Date,



however, the Services shall be furnished till the end of the design works for each design section, but no longer than sixty (60) months from the Signing Date.

3.2.6. Required Key-Experts and additional Experts for ESP are stated in Chapter 7 of this document.

3.2.7. ESP shall coordinate works with respective NoBo services provider. Reports developed by ESP shall be available to NoBo services provider. Client shall be included in the coordination process with NoBo. Client will provide ESP with all the necessary contact details of NoBo services provider.

3.2.8. Following requirements stated in NoBo TSI regulations shall not be a part of this Design Review and Design Expertise scope of work:

- Commission Regulation (EU) No 1299/2014;
- Commission Regulation (EU) No 1300/2014;
- Commission Regulation (EU) No 1303/2014;
- Commission Regulation (EU) No 1301/2014;
- Commission Regulation (EU) 2016/919.

### **3.3. Design sections**

3.3.1. To ensure proper planning and management of design deliverables, Rail Baltica in Estonia has been divided into three Design Sections. Each Design Section in turn is divided into Design Priority Section that are prioritized for the design process and construction implementation perspective.

3.3.2. Design Priority Sections are divided into Construction objects which are based on possible issuance of building permit. Indicative list and amounts of Construction objects in each design priority section, based on Preliminary Design solutions (Annex 4), are showed in DTD technical specifications (Annex 3). This amount of construction objects is indicative and shall not be treated as limiting and/or restricting the scope of Services. Tenderer shall take into account that actual number of total construction objects and structures may change during the Design process of Rail Baltica.

Table 1: Design Priority Sections

| Design Section              | Design priority section | Length (Preliminary design) | Indicative date of deliverable submission from Consultant |                           |
|-----------------------------|-------------------------|-----------------------------|---|---------------------------|
|                             |                         |                             | Master Design   | Detailed Technical Design |
| DTD1 (Rapla - Pärnu)        | I                       | 9.6                         | 03.2020   | 06.2020                   |
|                             | II                      | 13.9                        | 06.2020   | 10.2020                   |
|                             | III                     | 17.2                        | 06.2020   | 10.2020                   |
|                             | IV                      | 14.0                        | 08.2020   | 01.2021                   |
|                             | V                       | 15.7                        | 08.2020   | 01.2021                   |
| DTD2 (Tallinn - Rapla)      | I                       | 15.8                        | 04.2020   | 08.2020                   |
|                             | II                      | 19.3                        | 06.2020   | 10.2020                   |
|                             | III                     | 12.0                        | 03.2021   | 04.2021                   |
| DTD3 (Pärnu - EE/LV border) | I                       | 36.7                        | 03.2021   | 10.2021                   |
|                             | II                      | 31.5                        | 05.2021   | 01.2022                   |
|                             | III                     | 25.5                        | 08.2021   | 02.2022                   |

#### 4. Sequence and description of work procedure.

- 4.1. Communication between the Client and ESP shall be carried out in English.
- 4.2. ESP shall allocate financial resources for obtaining necessary number of licenses (at least 1) for accessing Clients Common Data Environment system.
- 4.3. As specified in the Contract, after signing date of Design Review and Design Expertise agreement, ESP shall prepare and deliver to the Client inception report, including, but not limited to:
  - Design Review and Design Expertise services organization chart with Key-experts and additional Experts with names and surnames, CV's and supporting information proving their compliance with the qualification, other requirements stipulated in the Design Review and Design Expertise Technical Specification and their roles and responsibilities;
  - Project Work Breakdown Structure;
  - Service provision general methodology, level of detail equivalent to AACE International Level 4 (detailed level);
  - Evaluation and proposals or additional improvements for provided checklist for Design Review services;
  - The risk assessment of the service provision and the risk mitigation plan.
- 4.4. With the respect to each deliverable, the Client shall inform the ESP at least 10 days before the design deliverables will be issued to the ESP for the Design Review and Design Expertise services execution. If available, Client will provide a draft of deliverable to ESP before services execution. Client is not obligated to provide draft of deliverable. Draft

of deliverable has not to be assessed. Draft of deliverable is only for informative purpose for upcoming Design Review and Design Expertise services.

- 4.5. Design Review and Design Expertise first examination for each deliverable unless otherwise agreed with the Client shall be carried out in 30 days. ESP is obliged to submit Design Review and Design Expertise reports to the client after the work completion but not later than 30 days after receiving the deliverable package.
- 4.6. During the Design Review and Design Expertise services ESP has 5 days to carry out administrative review. The aim of the administrative review is to check whether provided deliverable is complete. In case of missing documents/data in deliverable package for Design Review and Design Expertise the ESP shall as soon as possible inform the Client and Consultant. In case of incomplete deliverable it is up to the Client to decide if ESP Service provided shall carry out Design Review Services.
- 4.7. After Client receives a report from ESP, Client and Consultant has 10 days to evaluate non-conformities.
- 4.8. Client will arrange the coordination meeting after Client and Consultant has evaluated non-conformities. Coordination meeting will be arranged at Client premises and shall be notified at least 5 days in advance. ESP shall present Design Review or Design Expertise results. Requested Key-Experts and, if required, additional Experts are obligated to participate in the coordination meeting at client premises. . Exact list of participants shall be agreed before the meeting.
- 4.9. The minutes of the meetings shall be done in English language by ESP and sent to the meetings participants within 5 working days. ESP shall organize signing minutes of meetings.
- 4.10. Consultant shall implement the non-conformities (correct/improve the design document according to remarks) received from ESP and approved by Client from Design Review and Design Expertise services. Deadline for Consultant to implement comments will be set during the coordination meeting.
- 4.11. After the Consultant has implemented all non-conformities the Consultant shall submit the design for repeated examination by ESP:
  - 4.11.1. For Design Review only the specified part or section of the design shall be evaluated. If repeated examination for Design Review is carried out by another Key-expert or Additional Expert, then full Design Review is required.
  - 4.11.2. For Design expertise only the specified part or section of the design shall be evaluated and other related parts of the Design expertise, if impacted. If substantial modifications are made by the Consultant full Design expertise shall be carried out. If repeated examination for Design Expertise is carried out by another Key-expert or additional Expert, then full Design Expertise is required.
- 4.12. Every following Design Review and Design Expertise repeated examination for each deliverable shall be carried out in 7 days. The Expert is obliged to submit Design Review and Design Expertise reports to the Client after the work completion but not later than 7 day after receiving the deliverable package.
- 4.13. On completion of the Design Review and Design Expertise for a particular Service Module, the ESP shall submit to Client following deliverables:
  - 4.13.1. Report of Design Review by providing separate word or excel documents with all remarks (if any generated) according to each item in checklists of Annex 2.
  - 4.13.2. Report for Design Expertise (negative or positive) according to Estonian legislation. In case of non-conformities, a separate word or excel document with all remarks shall be provided.
- 4.14. The ESP is fully responsible for the content of the expert opinion and the validity of the conclusions contained therein.

4.15. ESP shall participate in the meetings upon the Client request as mentioned in Table 2 and shall procure the presence of the respective Key-Experts and Experts

Table 2: Meetings

| <b>Title</b>                  | <b>Responsible party organizing the meeting</b> | <b>Scheduling</b>   | <b>Participating parties (from both parties of the Contract)</b>      |
|-------------------------------|---|---|---|
| <b>Kick-off meeting</b>       | Client  | 7 days after signing of the Contract  | ESP and Client  |
| <b>Inception meeting</b>      | Client  | 19 days after signing of the Contract   | ESP and Client and other experts appointed by contract parties        |
| <b>Co-ordination meetings</b> | Client  | 5 days after completion of Design Review and Design Expertise services for particular deliverable | ESP Key-Experts, additional Expert (if needed), Client and Consultant |

## 5. Scope of Work for the Design Review and Design Expertise

### 5.1. General part

- 5.1.1. Deliverable from Client at commencement can be a whole Design Priority Section, part of Design Priority section, single construction object or a package of different construction objects.
- 5.1.2. Indicative list and amounts of Construction objects based on Rail Baltica Preliminary Design solutions are showed in DTD technical specification (Annex 3). Preliminary Design plan drawings are provided in Annex 4;
- 5.1.3. Design Review and Design Expertise services shall be provided to the Client for those design deliverables that will be handed over to the ESP from the Client during Master Design and Detailed Technical Design stage.
- 5.1.4. In Master Design stage Expertise Service Provider is obligated to check the Design according to Checklist in Annex 2 and provide legal expertise report according to Estonian legislation. Reports of Design Review and Design Expertise (Chapter 4.1.2) shall be provided to the Client for approval.
- 5.1.5. In Detailed Technical Design stage Service Provider is obligated to provide only Design Review services according to Checklist in Annex 2. Design Expertise report in Detailed Technical Design stage is not required.
- 5.1.6. ESP shall generate a report of Design Expertise according to Estonian legislation (signed by responsible Key-Experts and participating additional Experts) by providing separate word or excel documents with all remarks
- 5.1.7. Maximum number of examinations for Design Review and Design Expertise is two. Second examination shall be done only if there are non-conformities in first examination.
- 5.1.8. ESP shall evaluate and determine the compliance of the design, its content, volume and technical solutions with the requirements of the Detailed Technical Design Technical Specification (Annex 3), Checklist (Annex 2), building permit, affected party technical conditions, complicity of the design, consequences of non-conformities, accuracy and detalization of design and calculations and most up to date legislation acts, technical regulations and other applicable standards.
- 5.1.9. ESP as qualified, skilled and experienced professional shall carry out other works of services which are not directly indicated in the scope of work but are resulting from purpose and substance of the services and which are reasonably and substantially required for efficient and successful implementation of the services.
- 5.1.10. Design Review process shall be carried out based on the provided Checklist template in Annex 2. Checklist contains minimum information what shall be checked according to which standard, legislation act, regulation or any other applicable act. ESP shall review provided Checklist template and provide improvements according to ESP best professional practice if necessary before commencement date of first Service Module.
- 5.1.11. ESP shall do the Administrative review. The aim of the administrative review is to check whether provided deliverable is complete regarding to Technical Specification of Design and Design supervision services to check if all parts of the required Design Deliverable complies with the provided table of contents.
- 5.1.12. ESP shall evaluate BoQ calculation models for volumes (if provided) to determine whether calculation model is applicable and accurate. Report provided by ESP shall include re-calculations with the same calculation model provided by Consultant. If Consultant has not provided calculation model ESP shall find another most accurate and applicable method to re-calculate BoQ volumes. ESP shall assess whether all items of designed Construction works are included in BoQ. ESP shall assess whether all items

of BoQ are clearly and unambiguously identifiable. ESP shall assess mutual compliance between BoQ and Cost estimate.

5.1.13. Design Review and Design Expertise services for particular deliverable is considered as done after approval by Client.

5.1.14. For Utilities part checklist include reference to affected party technical condition requirements. Those requirements shall be used as the base requirement.

5.2. Design review for structures

5.2.1. Design review for different structures shall be done according to Checklist and level of calculation for every structure in provided deliverable.

5.2.2. Level of calculation is defined by the characteristics of the structures like span and length (Table 3) and other aspects mentioned in Table 4

5.2.3. Client will define the level of calculation for each structure in deliverable depending of the structure complexity, specific requirements (loads, geotechnical and hydrotechnical conditions etc.) and according to current design phase (MD or DTD)

Table 3: Example - Levels of calculation for typical reinforced/prestressed concrete structure

| Level of calculation | Structure complexity | Structure characteristics |                |
|----------------------|----------------------|---------------------------|----------------|
|                      |                      | Span (m)                  | Length (m)     |
| Level 1              | Simple               | 2 to 10                   | less than 30   |
| Level 2              | Low complexity       | 10 to 20                  | from 30 to 50  |
| Level 3              | Average complexity   | 20 to 30                  | from 50 to 150 |
| Level 4              | High complexity      | above 30                  | above 150      |

5.2.4. Scope of work for each level of calculation is provided in Table 4.

Table 4: Level of calculation minimum scope of work

| Level of calculation | Structure complexity | Other aspects | Review of Designer calculations |
|----------------------|----------------------|---------------|---------------------------------|
|                      |                      |               |                                 |

|         |                |   |   |
|---------|----------------|---|---|
| Level 1 | Simple         | Construction scheme complexity;<br>Materials (concrete, steel, composite, timber);<br>Dynamic behavior;       | <p>Expert's review should answer the following questions:</p> <ul style="list-style-type: none"> <li>• All relevant loads were considered in Design?</li> <li>• All loads used in calculations are well defined?</li> <li>• All relevant load combinations have been considered in Design?</li> <li>• All combinations used are well defined?</li> <li>• The used calculation methodology is appropriate regarding: <ul style="list-style-type: none"> <li>○ Structural software</li> <li>○ Structural models</li> <li>○ Methods of analysis</li> <li>○ Structural verifications (SLS, ULS, dynamic, fatigue, train-track considerations, foundations, etc.)</li> </ul> </li> <li>• Any relevant verification missing?</li> <li>• Results from calculations are reasonable?</li> <li>• Does element's geometrical parameters in calculation reports matches with information presented in the drawings?</li> </ul> <p>Expert is not expected to provide calculations, Design Review will be based on Expert experience, knowledge and benchmark with similar situations.</p>  |
| Level 2 | Low complexity | Interaction with other structures;<br>Track-structure behavior;<br>Fatigue behavior;<br>Foundation conditions | <p>In addition to Calculation Design Review Level 1 requirements Expert shall provide:</p> <ul style="list-style-type: none"> <li>• Confirmation of the results provided by the Designer by providing their own calculations</li> <li>• Calculations shall present the effects (forces, stresses, deformations, etc.) as well as the respective verifications according to relevant standards and calculation methodologies</li> <li>• Calculation shall be provided for the critical sections of the structures for service and also for critical construction situations if applicable</li> <li>• Critical sections shall include verification of distribution of large concentrated forces into the structure (bearing supports, prestress anchorages, connection sections)</li> <li>• The minimum verification set shall include but it is not limited to: <ul style="list-style-type: none"> <li>○ SLS (Stress limitation, crack control, deflection control, web breathing, etc.)</li> <li>○ ULS (resistance of cross sections, buckling of members, shear connection, punching, fatigue, etc.)</li> <li>○ Accidental actions</li> <li>○ Minimum reinforcement</li> <li>○ Nominal cover requirements</li> <li>○ Possible structural instabilities</li> </ul> </li> </ul> <p>Only static calculations are required</p> |

|         |                    |  |   |
|---------|--------------------|--|---|
| Level 3 | Average complexity |  | <p>In addition to Calculation Design Review Level 2 requirements Expert shall provide calculation to assess designer results in more specific topics. If applicable the illustrated topics here and other relevant aspects shall be investigated through independent calculations focus only on the main parameter necessary to verify safety of design:</p> <ul style="list-style-type: none"> <li>• Track-structure interaction calculation</li> <li>• Fatigue calculations</li> <li>• Buckling Analysis</li> <li>• Dynamic behavior of the structure</li> <li>• Vehicle-structure interaction</li> <li>• Soil-Structure Interaction</li> <li>• Joint connections</li> <li>• Construction stage analysis</li> </ul> |
| Level 4 | High complexity    |  | <p>In addition to Calculation Design Review Level 3 requirements Expert shall provide full independent design check calculations to at least the extent and level of detail provided by the designer</p>  |



### **5.3. Design Review and Design Expertise for Master Design**

In Master Design phase ESP shall:

- 5.3.1. Check the technical solutions of the design and to give an opinion on their conformity with the compliance of the Detailed Technical Design Technical Specifications of the design section.
- 5.3.2. Check the conformity of the construction solutions and materials selected in the project design with the requirements of the functionality and longevity of the designed solutions.
- 5.3.3. Check the compliance of Bill of Quantity with the design solutions.
- 5.3.4. Check structural calculations of every construction object provided by Client.
- 5.3.5. Expert shall review the demolition designs and reassess the neighboring design section compatibility.
- 5.3.6. Evaluate the Economic aspects of the project design. ESP shall check the conformity of the materials, prices, wages and mechanisms foreseen to be used with the most recent local market prices.
- 5.3.7. Evaluate utilities design solutions and compliance with the requirements stated in affected party technical conditions and utility design solution compatibility with the associated designs of railway, roads, structures and other respective design solutions in the design deliverables.
- 5.3.8. Mutual compliance between design parts (especially for crossings between utilities and constructions of structures);
- 5.3.9. Mutual compliance between text (explanatory note, lists, tables etc.) and graphical documents (drawings, sketches, plans, schemes, etc.);
- 5.3.10. Conformity of design solutions with the applicable safety (fire safety, civil protection, etc.) legislation acts and standards;
- 5.3.11. Compliance of the design solutions with the environmental requirements. ESP shall assess proposed solutions of work organization part regarding lowering impact during construction period;
- 5.3.12. Compatibility of neighboring design section solutions (including work organization part).

### **5.4. Design Review for Detailed Technical Design stage**

*Design Expertise report is not required in Detail Technical Design.*

In addition to scope of work in Chapter 5.1 and 5.2 ESP shall:

- 5.4.1. Check whether all necessary technical solutions for the works envisaged in the project design have been developed in sufficient detail and quality.
- 5.4.2. Check the sufficiency of the detail of the project design for the qualitative performance of the construction works in DTD.
- 5.4.3. ESP shall assess whether all items of designed construction works are included and clearly and unambiguously identifiable in BoQ. ESP shall carry out recalculations for every item which may affect more than 1.5% of construction object total CAPEX according to Consultant cost estimate. ESP shall assess compliance between BoQ and Cost estimation and evaluate whether materials, prices, wages and mechanisms used are with the most recent market prices.

## 6. Experts

- 6.1. Required ESP Experts for Design Review and Design Expertise services are stated in Table 5 of this document. Required additional Experts are stated in Table 6 of this document.
- 6.2. ESP shall be responsible for ensuring, that the proposed Key-Experts and additional Experts would have necessary certificates or/and other legal recognition documents in accordance to the Estonia legislation.
- 6.3. ESP and all involved Key-Experts and additional Experts shall not have any relation or connection to the designated Consultant for the respective design sections in Country.
- 6.4. Only in exceptional cases ESP Experts included in the Agreement can be replaced. ESP has no right to change the Expert without the approval of the Client. For each Expert change, the ESP shall obtain Client approval. To change the Key-Expert or additional Expert, ESP shall submit a request with all documents necessary for the Client to make sure that the proposed Key-Expert or additional Expert satisfies the qualification requirements set for relevant Key-expert or additional Expert in the procurement Regulation.
- 6.5. The qualification of Key-Experts and additional Experts must comply with the requirements of Estonia national legislation (if applicable). Cases when The Client is requiring additional qualification are in the Table 5.
- 6.6. The proposed Expert's English language level should be at least B2<sup>1</sup>.
- 6.7. The Client reserves the right to request the ESP to replace any Key-Expert or additional Expert in case of any of the following reasons:
  - Non-timely performance of the duties;
  - Repeated careless performance of duties;
  - Incompetence or negligence;
  - Non-fulfilment of obligations or duties stipulated in the Agreement;
  - Poor knowledge of English language;
  - Termination of employment relations with the ESP;
  - Design Expertise rights no longer exist or certificate or/and other legal recognition documents in accordance to the Country's legislation expired during services execution process;
  - Expert motivation or qualification is questionable.
- 6.8. Failing of the ESP to propose another Key-Expert or additional Expert with equivalent or better qualifications within 10 (ten) days, the ESP is considered to be under Delay of obligations pursuant to the Agreement.
- 6.9. The Client shall approve or reject the replacement, by specifying the reasons for rejection, of a Key-Expert or additional Expert as soon as possible, but not later than within 10 (ten) days after the receipt of all information and documents necessary for a decision and approval in accordance with the provisions in this Design Review and Design Expertise Agreement.
- 6.10. ESP shall propose a team consisting of the following qualified Key-experts meeting all the qualification requirements established for the Key-experts in Clause 7.5. of the Regulation document for this open competition "Detailed Technical Design Review and Design Expertise Services for Rail Baltica in Estonia", id. No RBR 2019/14, and in addition, meeting the following general criteria regarding Key-expert's professional competence (qualification), if applicable:

Table 5 Key experts

| No | Specialist Designation              | Professional competence (qualification) |
|----|-------------------------------------|---|
| 1  | Project Manager of Design Expertise | <i>Not applicable</i>                   |

|   |   |   |
|---|---|---|
| 2 | Structural Design Expert for Transport Structures | Qualified in relevant area (or equivalent certification/license) to provide Design Expertise Services in accordance with European Qualification Framework |
| 3 | Railway Track Design Expert                       | Qualified in relevant area (or equivalent certification/license) to provide Design Expertise Services in accordance with European Qualification Framework |
| 4 | Geotechnical Engineer or Engineering Geologist    | Qualified in relevant area (or equivalent certification/license) to provide Design Expertise Services in accordance with European Qualification Framework |

6.11. Professional competence (qualification) indicated in Table 5 shall be obtained for the provision of the Design Expertise Services during the fulfilment of the contract.

6.12. The following non-exhaustive list of additional qualified experts according to the European Qualification Framework are required at least in this project:

Table 6 Required non-exhaustive additional Experts

| No | Specialist Designation                                    | Professional competence (qualification)   |
|----|---|---|
| 1  | Road Design Expert  | Qualified in relevant area (or equivalent certification/license) to provide Design Expertise Services in accordance with European Qualification Framework |
| 2  | Structural Design Expert for road viaducts                | Qualified in relevant area (or equivalent certification/license) to provide Design Expertise Services in accordance with European Qualification Framework |
| 3  | Railway Track Design Expert for 1520 mm railway           | Qualified in relevant area (or equivalent certification/license) to provide Design Expertise Services in accordance with European Qualification Framework |
| 4  | Water, Stormwater and Drainage and sewage Design Expert   | Qualified in relevant area (or equivalent certification/license) to provide Design Expertise Services in accordance with European Qualification Framework |
| 5  | Land melioration systems design Expert                    | Qualified in relevant area (or equivalent certification/license) to provide Design Expertise Services in accordance with European Qualification Framework |
| 6  | Hydrotechnical structures design Expert                   | Qualified in relevant area (or equivalent certification/license) to provide Design Expertise Services in accordance with European Qualification Framework |
| 7  | High voltage (110 and more kV) power supply design Expert | Qualified in relevant area (or equivalent certification/license) to provide Design Expertise Services in accordance with European Qualification Framework |
| 8  | Network and Telecommunications Design Expert              | Qualified in relevant area (or equivalent certification/license) to provide Design Expertise Services in accordance with European Qualification Framework |
| 9  | High pressure Gas supply network design Expert            | Qualified in relevant area (or equivalent certification/license) to provide Design Expertise Services in accordance with European Qualification Framework |
| 10 | Cultural Heritage Expert                                  | Qualified in relevant area (or equivalent certification/license) to provide Design Expertise Services in accordance with European Qualification Framework |
| 11 | Environmental Expert                                      | Qualified in relevant area (or equivalent certification/license) to provide Design Expertise Services in accordance with European Qualification Framework |

|    |  |  |
|----|--|--|
| 12 | Construction works preparation and organization expert | Qualified in relevant area with previous experience for construction works preparation and organization for highspeed railway. |
|----|--|--|

7.15. Professional competence (qualification) indicated in Table 6 shall be obtained for the provision of the Design Expertise Services during the fulfilment of the contract.

<sup>1</sup> Language level is based on Common European Framework of Reference for Languages (see <http://europass.cedefop.europa.eu/resources/european-language-levels-cefr>)