



Detailed Technical Design Review and Design Expertise Services for Rail Baltica

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Meeting with Suppliers



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Meeting Agenda

- ⦿ Introduction to Rail Baltica project and project schedule.
- ⦿ Information on procurement in terms of general description and scope of work.
- ⦿ General information on timeline of required services.
- ⦿ Q&A session: Part 1: RB Rail AS questions; suppliers' answers;
- ⦿ Coffee break – 14:30, 15 min.
- ⦿ Q&A session: Part 2: suppliers' questions; RB Rail AS answers.

Design Speed

249 km/h – passenger trains
120 km/h – freight trains

Standard Gauge

1435 mm

Double-track Electrified

2x25kV AC

Axle Load

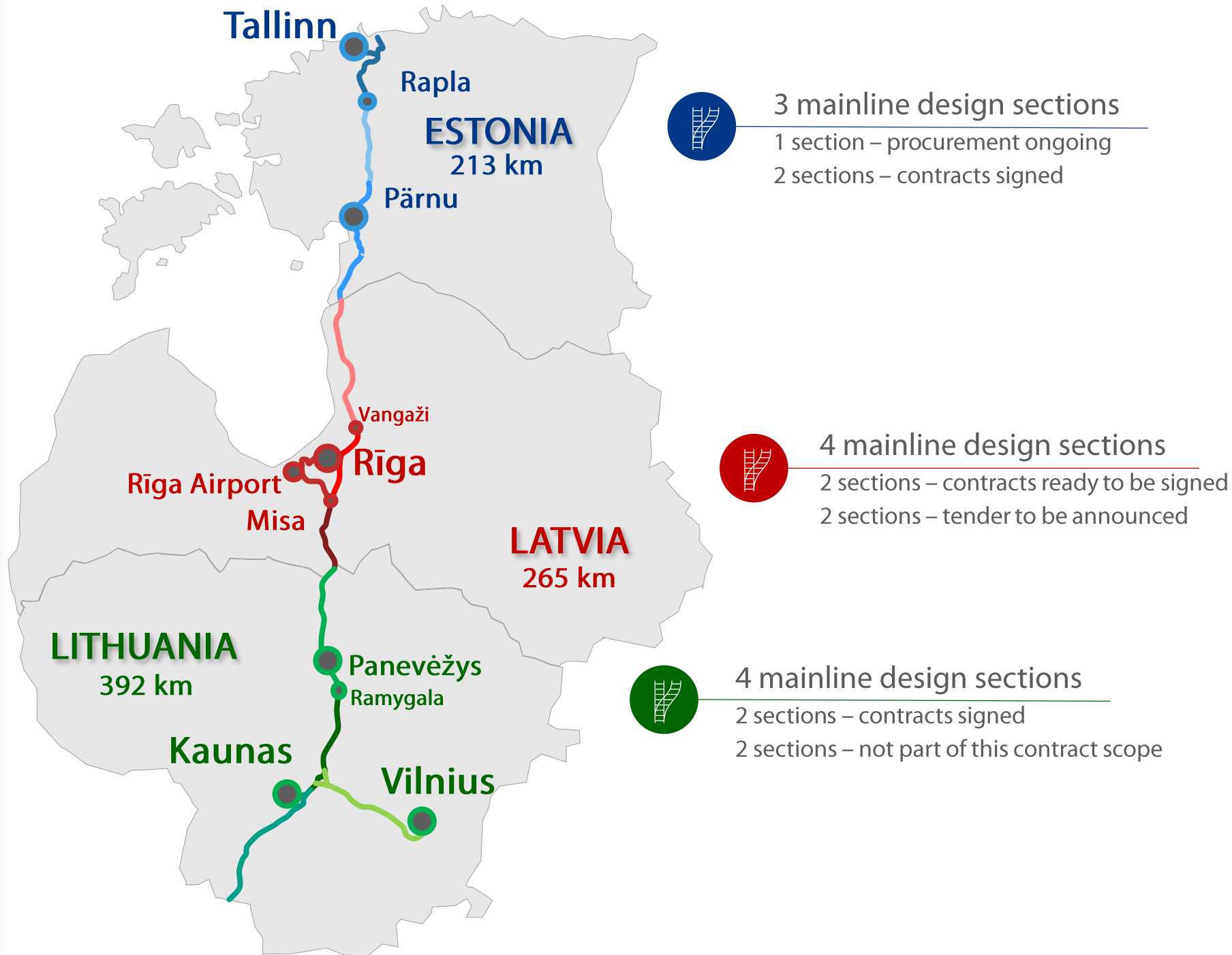
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Traffic Management

ERTMS 2

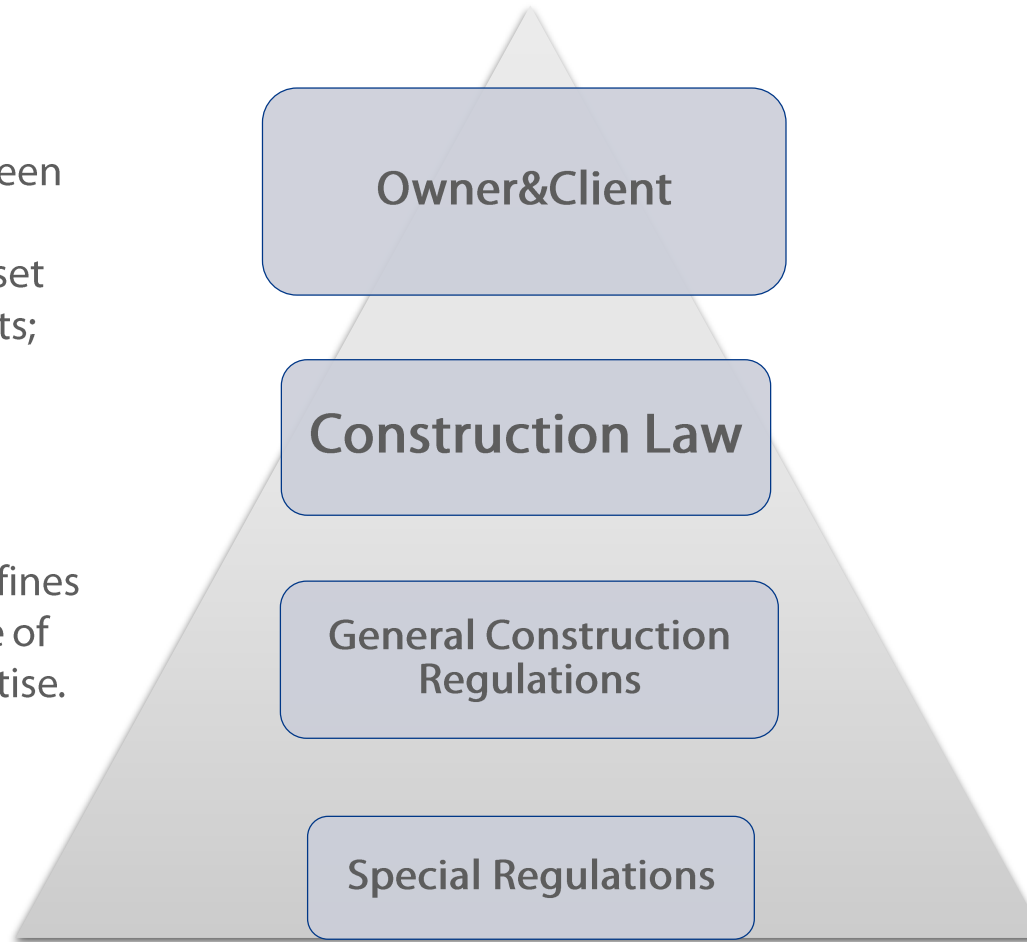
Max. Freight Train Length

1050 m



Laws and regulations for Construction process in Estonia, Latvia and Lithuania

- ✓ To ensure that works have been carried out in the highest possible quality Client shall set its own specific requirements;
- ✓ Construction Law describes general rules;
- ✓ Construction regulations defines general description of scope of work for Legal Design Expertise.



Owner and Client are fully responsible for the final deliverables and tender documents.

Defines responsibility of (The State Construction Control Bureau)

Defines structures that are mandatory for Design Expertise

Defines scope of Expertise – which part of Design must be expertised

Special regulation approved by Cabinet of Ministers defining minimal scope for Design Expertise in Estonia, Latvia and Lithuania



Estonia

- ✓ „Nõuded ehitusprojekti ekspertiisile“ Majandus- ja taristuministri 08.06.2015 määrus nr 62; Ehituseprojekti ekspertiisi tegemise kord RT I, 23.02.2012;

Latvia

- ✓ Construction regulations for railways (Dzelzceļa būvnoteikumi), MK Nr.530
- ✓ Construction regulations for roads and streets (Autoceļu un ielu būvnoteikumi), MK Nr.633
- ✓ Construction regulations for Buildings (Ēku būvnoteikumi), MK Nr.529
- ✓ Construction regulations for individual engineering structure (Atsevišķu inženierbūvju būvnoteikumi), MK Nr.253
- ✓ Construction regulations for hydrotechnical and melioration structure (Hidrotehnisko un meliorācijas būvju būvnoteikumi), MK Nr.550
- ✓ Construction regulations for electricity generation, transmission and distribution structures (Elektroenerģijas ražošanas, pārvades un sadales būvju būvnoteikumi), MK Nr.573

Lithuania

- ✓ Lietuvos Respublikos statybos įstatymas 1996-03-19 Nr. I-1240;
- ✓ Lietuvos Respublikos melioracijos įstatymas 1993-12-09 Nr. I-323; STR 1.04.04:2017
- ✓ „Statinio projektavimas, projekto ekspertizė“; MTR 1.05.01:2015 „Melioracijos statinių projekto ekspertizė ir melioracijos statinių ekspertizė“
- ✓ PTR 3.03.01:2005 „Nekilnojamojo kultūros paveldo statinio tvarkomųjų statybos darbų projekto ar tvarkomųjų paveldosaugos darbų projekto paveldosaugos (specialiosios) ekspertizės atlikimo taisyklės“

Consequences to be decreased and risks mitigated

⦿ General Design Expertise according to local legislation without additional Design Review and Design Expertise services with detailed task description.

- Risks during design phase:
 - Incomplete design deliverable check;
 - Extension of time for the design works;
 - Mistakes in Bill of Quantities;
 - Mistakes in Calculations;
 - Increase of Design Supervision Service fees;
 - Possible claims and variations during design stage.
- Construction procurement and construction implementation phase:
 - Extension of time for Construction procurement due to incomplete design;
 - Increase of CAPEX for Construction;
 - Problems with project financing;
 - Extension of time during Construction phase.

⦿ Design Expertise with additional Design Review with specific scope of work defined in Terms of Reference for the Design Expertise procurement.

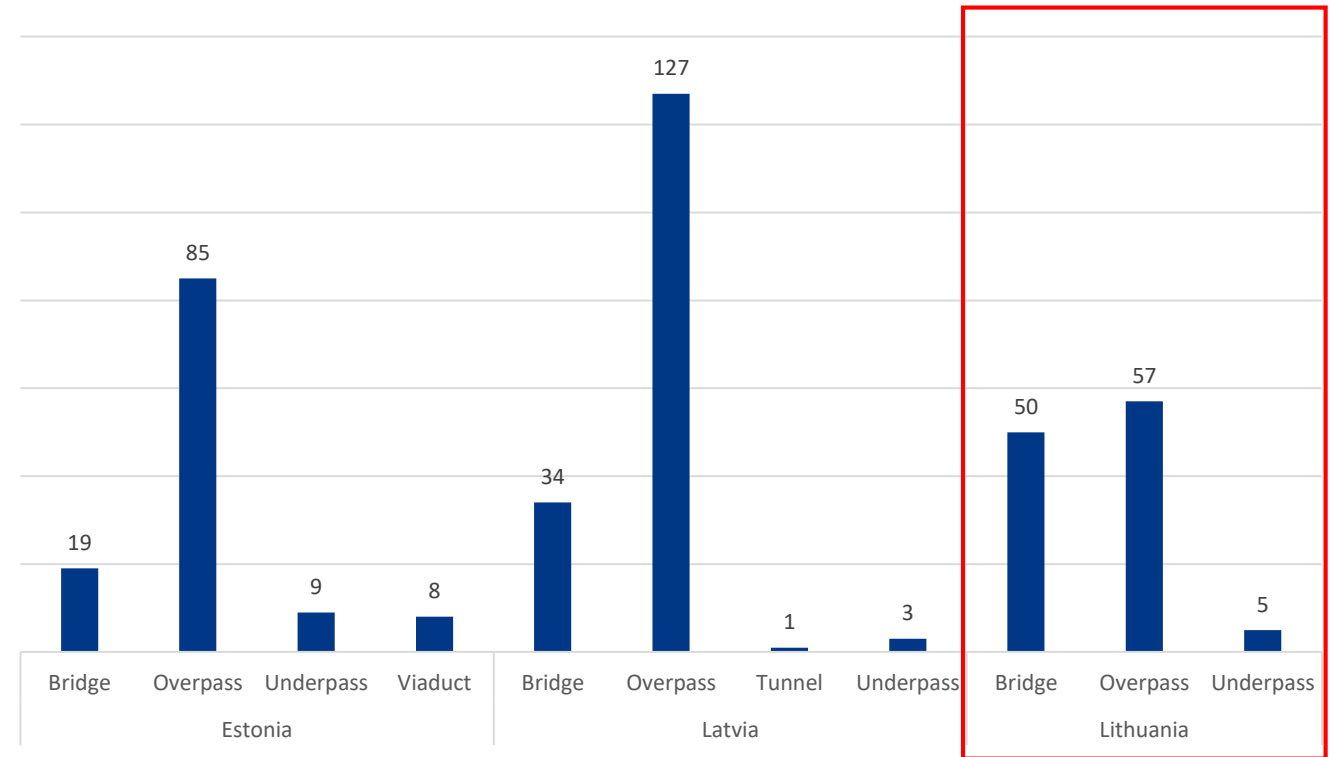
- Risks during design phase, construction procurement and construction implementation phase:
 - Design mistakes and errors shall be limited to minimum;
 - Design is completed in full compliance with contract agreements;
 - Contractor is not capable to prolong the procurement deadline relying on design errors and claim for variations during construction works relying on discrepancies in design;
 - Savings on CAPEX and OPEX.

⦿ Similar (depends on legal acts and budget) approach for all three Baltic state Detailed Technical Design shall be established to ensure that the best possible quality is achieved.

Amount of work for Rail Baltica Design Sections

⦿ Total number of design sections, length and number of structures:

- Estonia:
 - ❑ 3 Design sections - total length 213 km
 - ❑ Structures – 121
 - Parnu bridge – total length 295 m
 - Keila river bridge – total length 206 m
 - Crossing with Tallin ringroad – total length 450 m
- Latvia:
 - ❑ 4 Design sections - total length 265 km
 - ❑ Structures – 165
 - Gauja bridge – total length 1750 m
 - Daugava bridge – total length 1150 m
 - Tunnel in Torņkalns - total length 2400 m
- Lithuania:
 - ❑ 2 Design sections - total length 168 km
 - ❑ Structures- 112
 - Neris bridge – total length 1700 m
 - Šešuva bridge – total length 300 m
 - Mūša/Mūsa bridge – total length 225 m



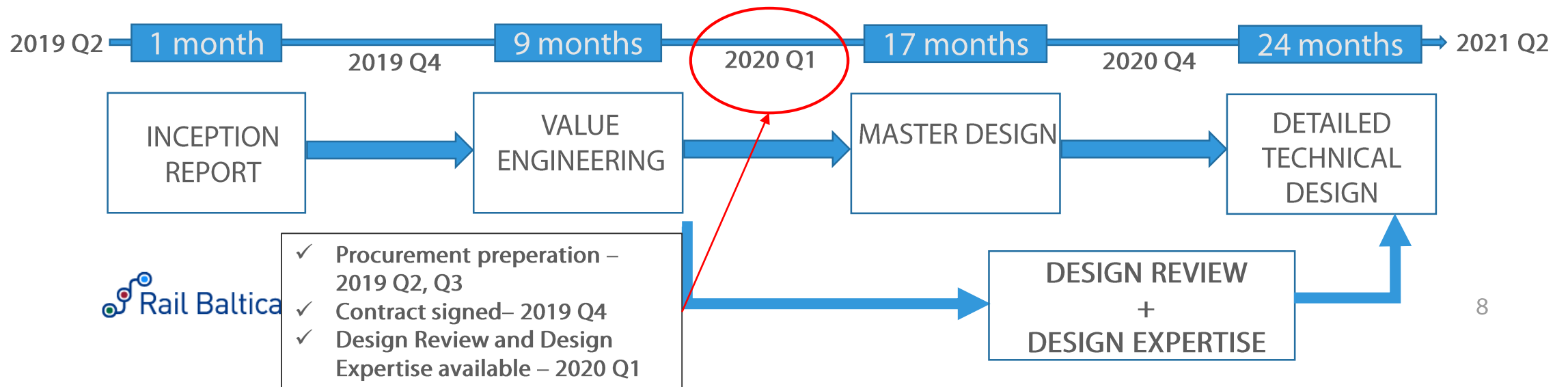
- ⦿ Culverts for waterway/ditch/melioration crossings >2,0 m
- ⦿ Road Interchanges with adjacent road infrastructure;
- ⦿ Underground and above ground utilities and adjacent infrastructure that is part of design scope of work.

| Total length | Total count | EE | LV | LT |
|--------------|-------------|----|----|----|
| <20m | 89 | 11 | 27 | 51 |
| 20m-40m | 136 | 19 | 93 | 24 |
| 40m-60m | 69 | 30 | 18 | 21 |
| 60m-100m | 68 | 50 | 9 | 9 |
| 100m-300m | 26 | 9 | 12 | 5 |
| 300m-500m | 6 | 2 | 3 | 1 |
| >500m | 4 | 0 | 3 | 1 |

When?

Design Review and Design Expertise timeline

- Design Review and Design Expertise Services shall be available as follows:
 - Starting from the beginning of Master Design stage;
 - During Detailed Technical Design Stage.
 - Expected peak for Design review is expected in 2020-2021.
- Duration for Design Deliverable (according to DTD TS) reviewal is as follows:
 - Master Design – 30 to 40 days
 - Detailed Technical Design – 30 to 40 days
 - (Deliverables will be handed over to Experts as soon as received)
- Design Expertise final approval with the positive decision will be submitted to the respective Authorities that will issue Construction Permits.
- Timeline example for Detailed Technical Design Sections.
 - Except: Parnu-EE/LV border design section is with 27 months duration,
 - Except: Vangaži-LV/EE border design section is with 30months.



Financing, procurement and contracting scheme

⦿ Financing:

- CEF 1 financing activity, according to Grant Agreement Amendments the planned possible budget could be EE-2.8 mill, LV-3.3 mill EUR, LT-1.0 mill EUR.

⦿ Planned procurement strategy (not yet aligned and confirmed):

- Open competition or restricted competition with 3 lots.
- One lot with three Design sections in Estonia:
 - Pärnu Rapla
 - Tallinn-Rapla
 - Pärnu-EE/LV border
- One lot with four Design sections in Latvia:
 - Vangaži-Salaspils Misa
 - Upeslejas-Riga, Misa
 - Vangaži-LV/EE border
 - Misa – LV/LT border
- One lot with two Design sections in Lithuania:
 - Kaunas-Ramygala
 - Kaunas – LT/LV border
- One contract for each lot;
- Planned procurement strategy is not yet finalized and will be aligned and confirmed after market analysis.

Required field of Experts

⦿ All Experts shall fulfil local legal acts

- Project Manager of Design Expertise
- Building Design Expert
- Architectural Design Expert
- Structural Design Expert for Civil Structures and Tunnels
- Highspeed Structural Design Expert for Transport Structures
- Highspeed Railway track Design Expert 1435mm
- Railway track Design Expert 1520mm
- Road Design Expert
- Water, Stormwater, Drainage and sewage Design Expert
- Land melioration and Hydrotechnical Expert
- Low voltage (up to 1kV) power supply design Expert
- Mid voltage (1-35kV) power supply design Expert
- High voltage (110 and more kV) power supply design Expert
- Network and Telecommunications Design Expert
- Gas supply network (max pressure $\leq 1,6$ MPa [16 bar]) design Expert
- Gas supply network (max pressure $> 1,6$ MPa [16 bar]) design Expert
- Mechanical Design Expert
- Environmental Expert

Example template for Design deliverables

- Typical example, template

| General Description of Deliverables |
|---|
| 1. General Part - Reports |
| Site Investigation reports |
| Topographical, Geotechnical, Hydrogeological and Hydrological |
| Proposed solutions for High Risk Areas |
| Embankment, Transition Zones |
| Bridge Abutments, Earth Retaining Structures |
| Traffic Safety Audit |
| 2. Design Parts |
| General Details |
| Design data, Horizontal, Vertical Curvature |
| General layout and utilities plan |
| Vertical and grading plan |
| Horizontal layout plan |
| Landscaping plans |
| Road Marking and Signage plan |
| Transport and Pedestrian Organization plan |
| Longitudinal profile |
| Railway Cross sections |
| Road Cross sections |
| Stakeout layout plan |
| Typical Details Drawings |
| Railway Track Design |
| Traffic Signaling plans |
| Traffic Signal Diagrams |
| Traffic Signal Power Supply |
| Traffic signal Cantilevers |
| Traffic Signal Gantry |

| |
|--|
| 3. Storm Water and Drainage Design |
| General layout plans |
| Storm Water and Drainage Layout plans |
| Storm Water and Drainage Longitudinal profiles |
| Storm Water and Drainage Cross sections |
| 4. Utilities part |
| Mechanical Design |
| Water supply networks |
| Sewage networks |
| Power supply (Internal) |
| Electrical network(External) |
| Electrical LV |
| Electrical HV |
| Telecommunications |
| Gas supply |
| Longitudinal profiles for Utilities part |
| Typical Details for Utilities |

| |
|---|
| 5. Structural Design for Road and Railway Embankments, Retaining Walls, Gabions, Reinforced soil walls, Culverts<2.0m |
| General Reports |
| Drawings |
| Calculation Reports |
| 6. Bill of Quantities |
| Part for Railway track, Railway and Road Crossings, Embankments |
| Part for Maintenance and Access Roads |
| Part for underground and above ground utilities |
| Part for work organization project |
| 7. BIM |
| BIM Model compliance with proposed design solutions |
| Rail, Road Interchange embankments and adjacent connected roads, layout plan compliance check with BIM model and required LOD. |
| Maintenance, Access roads design compliance according to information in BIM models and required LOD. |
| Above ground and underground utility compliance check from utility plans with the BIM models and required LOD. |
| Bill of Quantity general check from the BIM models |
| General check on clash detection analysis report to comply with the information in utility plans and BIM models. |
| Data Drops |

Example templates for Checklist and Financial proposal

Checklist template example

| No | Requirement | Reference | Item | Conformity |
|----|---|-------------------------------------|------------|------------|
| 1 | Twinning with high traffic routes | RBDG-MAN-012 | 7.1.1. | |
| 2 | Twinning with secondary roads | RBDG-MAN-012 | 7.1.2. | |
| 3 | The steel parts and structures shall be designed considering atmospheric corrosion class C4 according to EN ISO9223 or higher | RBDG-MAN-012 | 9.1 | |
| 4 | The concrete parts/Structures shall be designed considering exposure classes XD1, XC4, XS1, XS2, XF2, XF3 or XA2 according to EN206 | RBDG-MAN-012 | 9.2 | |
| 5 | The recommended exposure class for surfaces protected by waterproofing is XC3 | RBDG-MAN-012 | 9.2 | |
| 6 | The recommended classes for surfaces directly affected by de-icing salts are XD3 and XF4 | RBDG-MAN-012 | 9.2 | |
| 7 | General conformity | EN 1997-1, EN 1997-2 | Whole doc. | |
| 8 | General conformity | Affected Party Technical Conditions | Whole doc. | |
| 9 | Stormwater and Drainage for Roads | Affected Party Technical Conditions | Whole doc. | |
| 10 | Water supply networks | Affected Party Technical Conditions | Whole doc. | |
| 11 | Sewage networks | Affected Party Technical Conditions | Whole doc. | |
| 12 | Electrical networks low and mid voltage grid | Affected Party Technical Conditions | Whole doc. | |
| 13 | Electrical overhead crossings low and midvoltage | Affected Party Technical Conditions | Whole doc. | |
| 14 | Electrical power supply internal networks | Affected Party Technical Conditions | Whole doc. | |
| 15 | Highvoltage lines crossings | Affected Party Technical Conditions | Whole doc. | |
| 16 | Telecommunication and mobile cable networks | Affected Party Technical Conditions | Whole doc. | |
| 17 | Mechanical Engineering | Affected Party Technical Conditions | Whole doc. | |
| 18 | High pressure Gas networks | Affected Party Technical Conditions | Whole doc. | |
| 19 | Distric Heating networks | Affected Party Technical Conditions | Whole doc. | |
| 20 | Low and midpressure Gas networks | Affected Party Technical Conditions | Whole doc. | |
| 21 | Overall requirements | Agreement's Technical specification | Whole doc. | |
| 22 | Design Expertise report according to national legislation | National legislation acts | Legal act | |

Financial proposal template example

| Design review and Design Expertise Services for the Rail Baltica Detailed Technical Design Section | | | | | | | | |
|--|--|-------------------------|------------------|----------------------------|-----|--|-----|-----------------------------|
| No | Item | Unit | Amount of units* | Unit cost (excl. VAT), EUR | | Cost per design stage (excl. VAT), EUR | | Total cost (excl. VAT), EUR |
| | | | | MD | DTD | MD | DTD | |
| 1 | Expertise for Rail Baltica railway line | | | | | | | |
| Scope of work | | | | | | | | |
| 1,1 | General conformity regarding contract and technical specifications (content of deliverable, formatting of documentation, etc.) | 15,0 km of railway line | | | | | | |
| 1,2 | Site investigations (geodetic, topographic, geological, hydrogeological, etc.) | | | | | | | |
| 1,3 | Design solutions (alignment, longitudinal profile, cross sections, embankments, earthworks, etc.) | | | | | | | |
| 1,4 | Water drainage solutions | | | | | | | |
| 1,5 | Railway culverts (diameter 2m or higher) | | | | | | | |
| 1,6 | Ecoducts | | | | | | | |
| 1,7 | Railway structures (viaducts, overpasses and bridges) | | | | | | | |
| 1,8 | Railway tunnels | | | | | | | |
| 1,9 | Pedestrian crossings | | | | | | | |
| 1,1 | Utilities | | | | | | | |
| 1,11 | Affected party technical conditions | | | | | | | |
| 1,12 | Bill of quantities and cost estimation | | | | | | | |
| 1,13 | Specifications | | | | | | | |
| 1,14 | BIM deliverables | | | | | | | |
| 1,15 | Design solutions (alignment, longitudinal profile, cross sections, pavement, embankments, earthworks, etc.) | | | | | | | |
| 1,16 | Water drainage solutions | | | | | | | |
| 1,17 | Road structures (overpasses and underpasses) | | | | | | | |
| 2 | Expertise for national roads | | | | | | | |
| Scope of work | | | | | | | | |
| 2,1 | General conformity regarding contract and technical specifications (content of deliverable, formatting of documentation, etc.) | 1,0 km of national road | | | | | | |
| 2,2 | Site investigations (geodetic, topographic, geological, hydrogeological, etc.) | | | | | | | |
| 2,3 | Design solutions (alignment, longitudinal profile, cross sections, pavement, embankments, earthworks, etc.) | | | | | | | |
| 2,4 | Water drainage solutions | | | | | | | |
| 2,5 | Road structures (overpasses and underpasses) | | | | | | | |
| 2,6 | Utilities | | | | | | | |
| 2,7 | Affected party technical conditions | | | | | | | |
| 2,8 | Bill of quantities and cost estimation | | | | | | | |
| 2,9 | Specifications | | | | | | | |
| 2,10 | BIM deliverables | | | | | | | |

Questions

- ④ Does the current market is capable to provide necessary experts and cover required scope of work for all design sections for each country?
- ④ What is approximate percentage from the design fees for design expertise from similar projects in foreign countries?
- ④ If local companies does not have enough resources, how quickly can foreign experts get their certificates attested for required fields of expertise:
 - 1435mm highspeed railway track gauge;
 - Highspeed railway bridges, viaducts and other structures;
 - Tunnel experts;
 - High pressure gas pipelines;
 - High voltage overhead line experts.
 - BIM experts;



**PALDIES!
THANK YOU!
AITÄH!
AČIŪ!
KIITOS!
DANKE!
MERCII!
DZIĘKUJĘ!**