

Appendix No 1
To Technical Specification for
Design guidelines for Rail Baltic / Rail Baltica railway

RB Rail AS

DRAFT
Technical standards and specifications Manual of Rail Baltic
/ Rail Baltica Railway

Riga
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1. Glossary

1. **Infrastructure** – railway infrastructure as defined in the Directive 2012/34/EU.
2. **Contracting Agency** - RB Rail AS or the other contracting party, which performs tasks as a contracting agency as agreed under the 30/09/2016 Contracting Scheme Agreement.
3. **Design** – technical design based on which a building permit for construction works is issued and construction is being made.
4. **Design Guidelines** – set of predefined and standardized technically and economically justified engineering and design solutions for Rail Baltic/Rail Baltica to be applied at design, construction and operation phases of the Railway. Design guidelines are mandatory for all stakeholders involved in design and construction of the Railway.
5. **CMP** - Change management procedure that describes process and responsible for updating Technical standards and specifications Manual of Rail Baltic/Rail Baltica Railway.
6. **Manual** - Technical standards and specifications Manual of Rail Baltic/Rail Baltica Railway.
7. **Main passenger stations** – Tallinn, Pärnu, Riga Central, Riga Airport, Panevėžys, Kaunas, and Vilnius.
8. **Project** - design, construction and marketing (including branding) of the Railway with the purpose of achieving the Project Outcome.
9. **Project Outcome** - the completion of the design, construction, testing and commissioning of the entire Railway; including the registration of the entire Railway in the relevant governmental registers and including adopted operational rules.
10. **Railway** - new fast conventional double track electrified railway line with the maximum design speed of 240 km/h and European standard gauge (1435 mm) on the Route.
11. **Route** - from Tallinn through Pärnu – Riga – Panevėžys-Kaunas to Lithuanian-Polish Border on the route as proposed by AECOM study with a connection of Vilnius-Kaunas as a part of the Railway.
12. **Subsystem** - structural or functional part of the European Union rail system, as set out in the Directive 2008/57/EC
13. **Technical Specification of Interoperability (TSI)** - a specification adopted in accordance with the Directive 2008/57/EC by which each subsystem or part of a subsystem is covered in order to meet the essential requirements and ensure the interoperability of the European Union rail system.
14. **ERTMS** – European railway traffic management system.
15. **ERA** – European Railway Agency. For the purpose of this document this abbreviation refers also to the European Union Agency for Railways (EUAR), which is succeeding the European Railway Agency.

2. Scope

16. The technical standards, specifications, rules, principles and procedures set out hereinafter (furthermore referred to as Manual) are mandatory for design and construction of all subsystems of the Railway.
17. Manual is applicable to any construction works related to the Railway as long as its requirements are related to the entire railway infrastructure system.
18. Manual is binding for the entire Railway without any exceptions.

3. General principles

19. The entire railway infrastructure system is to be designed and built in accordance with the relevant Technical Specifications of Interoperability (furthermore referred to as TSIs), this Manual and Design Guidelines.
20. Chapter 4 and Design Guidelines provide further project specific detail and clarity above and beyond the mandatory EU law, including TSIs, and EN standards.
21. Where none of the above (Points 19 and 20) is present the European standard (EN) should be sought for and applied thoroughly by the Contracting Agency and has to be notified to RB Rail AS according to the Change Management Procedure (furthermore referred to as CMP). The non-exhaustive list of the applicable EN standards is attached in Appendix 1.
22. Should it appear that documents referred to in Points 19 through 21 do not cover any specific issue, the national rules could be applied. In this case the national rule in question has to be notified to RB Rail AS according to the Change Management Procedure set out in Chapter 5 of the Manual before it is included in any documents related to the Project.
23. Standards and norms may change from time to time as well as new standards and norms may be produced and implemented during the Rail Baltic/Rail Baltica project period. It is a responsibility of RB Rail AS to check the availability of standards and norms, and their updates and to inform the relevant Contracting Agencies.
24. In case such updates have occurred during the working phase and the new requirements are different from those applied in the previous stages of the work process, the Contractor through its relevant Contracting Agency, and the Contracting Agency through RB Rail AS should seek for a resolution regarding the applicable standards in line with CMP.
25. CMP has to be applied when there are perceived contradictions discovered between any requirements applicable according to the Manual or between the requirements applicable according to the Manual and any national rules and regulations.

4. Specific rules and requirements

4.1. Infrastructure subsystem

26. The performance parameters of the Railway are to comply with the line category P2/F1 as defined by the TSI INF.
27. Design speed on main tracks 240km/h.
28. Minimum design speed for turnouts on side tracks diverging from main tracks 100km/h, except main passenger stations.
29. Axle load 22.5 t.
30. Rail inclination 1/40.
31. Minimum distance between track centers 4.20 m on main tracks. Between side tracks – at least 4.20 m but considering the functionality of the track.
32. Length of freight trains 740 m.
33. For spatial planning and track geometry design a length of 1050 m shall be used for freight trains.
34. Distance between passing loops approximately 50 km. The passing loops are on both sides of the main track. The passing loop location shall be considered with the view of regional development (regional passenger and freight traffic).
35. Distance between main track interconnections approximately 25km.
36. Minimum length of passenger platforms for international service in main passenger stations at least 200 m.
37. For spatial planning and track geometry design a length of 400 m shall be used for passenger trains.
38. Passenger platforms for potential local traffic are to be planned and designed so that local passenger traffic do not create any obstacles for international freight and passenger traffic on the line.
39. Passenger platform safety zone should be at least 0,8 m.
40. Height of passenger platforms 550 mm.
41. Fences, where required, are to be constructed with minimum height 1,8 m on both sides of the tracks of the line taking into account the EIA and / or Railway risk assessment requirements.
42. Fauna passages are to be built along the line according to EIA requirements.
43. Noise barriers, where required, are to be built according to noise modeling results that are based on the same traffic forecasts and operating assumptions in the full length of the Railway.
44. Maintenance road shall be designed, where justified, on one side of tracks with gravel 3,5 m wide. On the other side of tracks a clear area accessible by specialized traction vehicles only is to be provided. Maintenance roads will not have public access.

45. All road, pedestrian crossings and crossings with 1520 mm gauge railway system – shall be designed and built only as segregated grade crossings.

4.2. Control, command and signalling subsystem

46. Traffic management system ERTMS Level 2, with possible update to the newest version, or Level 3 if application on mixed traffic line is feasible from technical / technology considerations. For final ERTMS deployment a common solution for the entire line shall be applied based on latest developments of ERTMS.
47. Communications system GSM-R, with a view to the new generation railway communications standard to be worked out by 2018 and implemented by 2022 according to the available ERA timetable.

4.3. Energy subsystem

48. Power requirement for energy subsystem calculations is based on maximum power requirement of passenger train 6 MW.
49. Maximum power requirement of freight train for energy subsystem calculations shall be assumed based on train weight of max 5000 t and based on track geometry and performance regime in relevant power substation zone but not less than 7 MW.
50. Power supply system solution 2x25 kV AC.
51. Power supply lines for feeding from the grid will be provided within each country. The power substation shall ensure cross-border power supply.
52. Recuperated energy to be accumulated and used within the railway network if the proven technology is available.
53. The general approach to the design of the energy subsystem is to consider all the requirements on the entire route. To avoid power interruption and increase power supply system reliability the location and parameters of each power substation shall be estimated based on the power supply system modeling for the maximum traffic volume according to the planned train graph and the calculation shall demonstrate that train traffic can be organized in an emergency state by next substations. The substations design shall allow the necessary upgrade in the future to accommodate full weight (based on axle load defined in Point 29) 1050 m long freight train operation and the increased traffic volume on the intersections between the power substations.

4.4. Design, construction, operations phase language

54. Design, construction, operations phase language is English. Documents for approvals shall be provided as well in national language in accordance with national legal requirements. For operations phase, exceptions from single operations language – English - may be granted in duly justified cases and only in the areas which do not affect effective operations and management; the exception has to be notified to RB Rail AS according to the CMP.

5. Change management procedure

55. CMP has to be applied:

55.1. In cases referred to in Points 21, 22 and 50 of the Manual.

55.2. Whenever derogations from the Manual are deemed to be necessary by RB Rail AS due to environmental restrictions in the construction area.

55.3. Whenever RB Rail AS suggests that derogations from the Manual are useful because of specific economic considerations.

55.4. Whenever RB Rail AS suggests that derogations from the Manual are useful because of specific safety considerations.

56. In any of the cases above the Contracting Agency submits the justified application to RB Rail AS complemented with the underlying documentation in English it considers to be relevant for the case. RB Rail AS decides by its Management Board to initiate the CMP or not. If RB Rail AS Management Board decides not to initiate the CMP, RB Rail AS sends to the Contracting Agency a formal rejection letter with explaining grounds for not initiating the CMP of the case.

57. RB Rail AS is in charge of technical and economic impact assessment and risk assessment of the case. The deadlines for impact assessment are established by its Supervisory Board taking into account the Project implementation schedule and the complexity of the task.

58. RB Rail AS may involve independent external experts to carry out the impact assessment.

59. RB Rail AS may request additional information from the Contracting Agency. Should it occur, the Contracting Agency is liable to provide by mutually agreed deadline any such information that is in its disposal or that it could access or produce faster or cheaper than RB Rail AS.

60. Exchange of information regarding the CMP should be done in writing, except where it has been explicitly agreed by the parties involved to use electronic media instead.

61. RB Rail AS may organize meetings involving interested parties selected at its discretion wherever it considers such meetings necessary or useful or where such a meeting has been requested by the Contracting Agency.

62. RB Rail AS makes the final decision (furthermore referred to as the Decision). RB Rail AS disseminates the Decision to all the Contracting Agencies as soon as possible but in any case, no later than within 14 calendar days after it is made.

63. The Decision is binding for all Contracting Agencies.

64. The Decision takes an immediate effect unless otherwise specified.

65. The Decision cannot be appealed against under no circumstances. The Decision shall not contradict with external binding requirements (i.e. laws and regulations); in the case of a such contradiction the Decision shall be considered ineffective, and shall be revised.

66. As Decision is made RB Rail AS conduct updates in Manual and publishes it on announced date according to Decision.

Appendix 1. List of applicable standards and norms (non – exhaustive list)

For clarity please refer to standards listed in the relevant TSI (Appendix T for the INF TSI, Appendix A for the PRM TSI, Appendix A for the SRT TSI, Table A4 of Annex A of the CCS TSI and Appendix E of ENE TSI)

Infrastructure subsystem (INF)

COMMISSION REGULATION (EU) No 1299/2014 of 18 November 2014 on the technical specifications for interoperability relating to the 'infrastructure' subsystem of the rail system in the European Union.

Commission Recommendation 2014/881/EU on the procedure demonstrating the level of compliance of existing railway lines with the basic parameters of the technical specifications for interoperability

COMMISSION REGULATION (EU) No 1300/2014 of 18 November 2014 on the technical specifications for interoperability relating to accessibility of the European Union's rail system for persons with disabilities and persons with reduced mobility.

COMMISSION REGULATION (EU) No 1303/2014 of 18 November 2014 concerning the technical specification for interoperability relating to 'safety in railway tunnels' of the rail system of the European Union.

EN 13230 Railway applications - Track - Concrete sleepers and bearers

EN 13232 Railway applications - Track - Switches and crossings

EN 13481 Railway applications - Track - Performance requirements for fastening systems

EN 13674 Railway applications - Track – Rail

EN 13803 Railway applications - Track - Track alignment design parameters - Track gauges 1435 mm and wider

EN 13848 Railway applications - Track - Track geometry quality

EN 14033 Railway applications - Track - Rail bound construction and maintenance machines

EN 14067 Railway applications – Aerodynamics

EN 14587 Railway applications - Track - Flash butt welding of rails

EN 15273 Railway applications - Gauges

EN 15302 Railway applications - Method for determining the equivalent iconicity

- EN 15437-1:2009 Railway applications - Axle box condition monitoring - Interface and design requirements - Part 1: Track side equipment and rolling stock axle box
- EN 15461:2008+A1:2010 Railway applications - Noise emission - Characterization of the dynamic properties of track sections for pass by noise measurements
- EN 15528 Railway applications - Line categories for managing the interface between load limits of vehicles and infrastructure
- EN 1990 Eurocode - Basis of structural design

Control, command and signalling subsystem (CCS)

- COMMISSION DECISION 2012/88/EU of 25 January 2012 on the technical specification for interoperability relating to the control-command and signalling subsystems of the trans-European rail system.
- COMMISSION DECISION 2012/696/EU of 6 November 2012 amending Decision 2012/88/EU on the technical specifications for interoperability relating to the control-command and signalling subsystems of the trans-European rail system
- COMMISSION DECISION (EU) 2015/14 of 5 January 2015 amending Decision 2012/88/EU on the technical specification for interoperability relating to the control-command and signalling subsystems of the trans-European rail system
- EN 50126 Railway applications - The specification and demonstration of Reliability, Availability, Maintainability and Safety (RAMS)
- EN 50128 Railway applications - Communication, signalling and processing systems
- EN 50129 Railway applications - Communication, signalling and processing systems - Safety related electronic systems for signaling
- EN 50159 Railway applications - Communication, signalling and processing systems - Safety-related communication in transmission systems
- EN 50238 Railway applications - Compatibility between rolling stock and train detection systems

Energy subsystem (ENE)

- COMMISSION REGULATION (EU) No 1301/2014 of 18 November 2014 on the technical specifications for interoperability relating to the 'energy' subsystem of the rail system in the Union.
- Corrigendum to the ENE TSI (Reg.1301/2014)
- EN 50119 Railway applications. Fixed installations. Electric traction overhead contact lines
- EN 50122 Railway applications - Fixed installations - Electrical safety, earthing and the return circuit
- EN 50124 Railway applications - Insulation coordination

- EN 50125 Railway applications - Environmental conditions for equipment
- EN 50151 Railway applications - Fixed installations - Electric traction - Special requirements for composite insulators
- EN 50163 Railway applications - Supply voltages of traction systems
- EN 50317 Railway applications - Current collection systems - Requirements for and validation of measurements of the dynamic interaction between pantograph and overhead contact line
- EN 50318 Railway applications. Current collection systems. Validation of simulation of the dynamic interaction between pantograph and overhead contact line
- EN 50367 Railway applications - Current collection systems - Technical criteria for the interaction between pantograph and overhead line (to achieve free access)
- EN 50388 Railway applications - Power supply and rolling stock - Technical criteria for the coordination between power supply (substation) and rolling stock to achieve interoperability

Other specifications

UIC Code: 719R. „Earthworks and track bed layers for Railway lines “, 1994