

## DESIGN GUIDELINES

# INFRASTRUCTURE FACILITIES

RBDG-MAN-025-0109

<b>Revision Number:</b>	9.0	<b>Effective From:</b>	2026-03-20
-------------------------	-----	------------------------	------------

Document owner	Operation Engineer	Jonathan Witte
Prepared by	Operation Engineer	Jonathan Witte
Reviewed by	Operation and Maintenance Team Leader	Konstantinos Tzanakakis
	Head of Systems and Operation Department	Jean Marc Bedmar
	Deputy Chief Technical Officer	Tomas Tatarėlis
	CTO, Management Board Member	Emilien Dang

<b>Approved by</b>	Project Steering Committee	-
--------------------	----------------------------	---

THIS DOCUMENT IS REVIEWED AND APPROVED ELECTRONICALLY IN EDMS

DOCUMENT UNCONTROLLED WHEN PRINTED



Co-funded by  
the European Union

# Document History

This document has been issued and amended as follows:

Revision	Effective from	Author	Description of changes
1.0	19.03.2018	System and Operations	Initial delivery
2.0	01.04.2019	System and Operations	Update of usable lengths of platforms and tracks
3.0	13.07.2020	System and Operations	Update of useable length requirements
4.0	09.03.2021	System and Operations	Update of regional station platform length and platform offset
5.0	31.05.2021	System and Operations	Update of adding new paragraph 7 regarding numeration principles of railway infrastructure elements
6.0	06.12.2021	System and Operations	Update of platform height increase section 1.1
7.0	28.11.2022	System and Operations	The numbering/codification of operational points added to DG
8.0	06.05.2025	System and Operations	Requirements regarding Overhead Contact System (OCS) added
9.0	20.03.2026	System and Operations	Complete rework to adjust to planning stage of the project

# Table of contents

Document History .....	2
Table of contents .....	3
Table of figures .....	5
Table of tables .....	6
Acronyms and Abbreviations .....	8
Definitions .....	9
<b>1 Scope.....</b>	<b>13</b>
<b>2 Operational Points .....</b>	<b>13</b>
2.1 Types and definition of Operational point.....	13
2.2 The Codification Operational Points.....	15
<b>3 General types of Stations .....</b>	<b>16</b>
<b>4 Detailed dimensions and parameters of stations .....</b>	<b>19</b>
4.1 Station through track and side track dimensions .....	19
4.2 Typical track layouts and dimensions .....	21
4.3 Emergency and maintenance sidings and safety tracks in stations.....	23
4.4 Emergency Platform .....	24
4.5 Overhead Contact System .....	25
<b>5 Length of passenger station platforms.....</b>	<b>25</b>
<b>6 Crossovers and junctions .....</b>	<b>29</b>
6.1 Design and function of crossovers .....	29
6.2 Alignment and types of junctions.....	30
<b>7 Access to other facilities outside the main line .....</b>	<b>33</b>
<b>8 Numeration of lines .....</b>	<b>36</b>
8.1 Change of line and km-chainage.....	38
8.2 Numeration of main and branch line tracks.....	40
<b>9 Codification of elements in railway infrastructure facilities .....</b>	<b>41</b>
9.1 Tracks in infrastructure facilities.....	41
9.2 Turnouts in stations, junctions and crossovers.....	43
9.3 Platforms .....	44
9.4 Buffer stops .....	46
9.5 Rail expansion joints (REJ) .....	46
9.6 Derailers .....	47
<b>10 Infrastructure Phasing .....</b>	<b>48</b>
Process control.....	49

<b>Review and update of the Document.....</b>	<b>49</b>
<b>References .....</b>	<b>49</b>

## Table of figures

Figure 1: Halt on the open line	16
Figure 2: Regional Station with Crossovers	16
Figure 3: Schematical track layout for a Passing Loop	17
Figure 4: Regional and international station with one side track per direction for 200 m or 400 m long passenger trains and 1.050 m long freight trains	17
Figure 5: Regional and international station with two side tracks per direction for parallel stop of 200 m long regional and 400 m long international passenger service and/or 1.050 m long freight trains	17
Figure 6: Train stopping at the station through track inside a station	20
Figure 7: Train stopping on a side track inside a station	20
Figure 8: Train stabled on an emergency and maintenance siding or a safety track	20
Figure 9: Detailed alignment of station elements around turnouts (objects only indicative)	22
Figure 10: Elements and lengths of station through track between turnouts in stations	22
Figure 11: Elements and lengths of station side track between turnouts in stations	22
Figure 12: Case of additional side track in stations (for example additional dead-end side track)	23
Figure 13: Side tracks in stations for short-term parking of vehicles in the emergency and maintenance siding	23
Figure 14: Emergency and maintenance sidings and safety tracks in stations	24
Figure 15: Construction length of through track platform for MU	26
Figure 16: Construction length of through platform for locomotive hauled train only with ETCS-marker board	26
Figure 17: Construction length of through platform for locomotive hauled train with extra Stopping marker	26
Figure 18: Construction length of dead-end platform for MU	27
Figure 19: Construction length of a dead-end platform for a locomotive hauled train	27
Figure 20: Maximum length of trains overlapping the platform	27
Figure 21: Coupling process for regional trains on 210 m long platforms for two 100 m long MUs	28
Figure 22: Crossover on the open line	29
Figure 23: Crossovers (Full Crossovers) in stations (regional and international stations and passing loops)	29
Figure 24: Reduced scope of crossovers (Half Crossovers)	30
Figure 25: Double-track and grade separated junction (including crossovers)	32
Figure 26: Complete Triangle with three grade separated free double-track design junctions (Crossovers in black)	32

<b>Figure 27: Reduced triangle with one single-track at-grade line between the north and west junction</b>	<b>33</b>
<b>Figure 28: Tracks inside station foreseen for open line services.</b>	<b>34</b>
<b>Figure 29: Example of connections of adjacent facilities in a typical station (passing loop)</b>	<b>35</b>
<b>Figure 30: Example of private siding with specialized Entry/Exit track for rolling stock depot</b>	<b>35</b>
<b>Figure 31: Schematic line numeration and direction of increasing km-chainage</b>	<b>37</b>
<b>Figure 32: Change of Line km-chainage at the beginning of a diverging new line with growing km-chainage</b>	<b>39</b>
<b>Figure 33: Change of Line km-chainage at the ending of the line joining another line with growing km-chainage</b>	<b>39</b>
<b>Figure 34: Line and km-chainage change inside stations</b>	<b>40</b>
<b>Figure 35: Numbering of tracks in the open line</b>	<b>40</b>
<b>Figure 36: Numbering of tracks in infrastructure facilities</b>	<b>41</b>
<b>Figure 37: Numeration of turnouts in stations</b>	<b>43</b>
<b>Figure 38: Numeration of turnouts in junctions of triangles</b>	<b>44</b>
<b>Figure 39: Buffer stops and platforms in stations</b>	<b>45</b>
<b>Figure 40: Railway Infrastructure Schematic for Phase 1 (Excerpt)</b>	<b>48</b>

## Table of tables

<b>Table 1: Definition of Operational points (OP)</b>	<b>13</b>
<b>Table 2: Codification of the operational points</b>	<b>15</b>
<b>Table 3 General characteristics for Stations and Halts</b>	<b>18</b>
<b>Table 4: Type of track lengths</b>	<b>19</b>
<b>Table 5: Protection section length</b>	<b>21</b>
<b>Table 6: Usable / nominal platform length / Maximum length of train</b>	<b>25</b>
<b>Table 7: Selection of most important junction on the Rail Baltica (not complete list)</b>	<b>30</b>
<b>Table 8: Legend for the lines shown in the figure above</b>	<b>38</b>
<b>Table 9: Numeration of main line tracks</b>	<b>40</b>
<b>Table 10: Codification of station through tracks in infrastructure facilities</b>	<b>42</b>
<b>Table 11: Codification of side tracks in infrastructure facilities</b>	<b>42</b>
<b>Table 12: Codification of track sections like EMS and ST</b>	<b>43</b>
<b>Table 13: Codification of turnouts in Operational points (stations, junctions, crossovers)</b>	<b>44</b>
<b>Table 14: Codification of platforms</b>	<b>45</b>

<b>Table 15: Codification of buffer stops</b>	<b>46</b>
<b>Table 16: Codification of rail expansion joints (REJ)</b>	<b>47</b>
<b>Table 17: Codification of derailleurs</b>	<b>47</b>

## Acronyms and Abbreviations

A full list of acronyms and abbreviations can be found in RBR Glossary of Abbreviations. The following acronyms and abbreviations are used throughout this document:

Abbreviation	Definition
BA	Braking inaccuracy
BEMU	Battery electric multiple unit
CO	Crossover
CS	(Un-) Coupling section/space
DMU	Diesel multiple unit
EEA	European Economic Area
EMS	Emergency and Maintenance siding
EMU	Electric multiple unit
ETCS	European Train Control System
EU	European union
HJ	Heel Joint
IM	Infrastructure manager
INF TSI	Infrastructure Technical Specifications for Interoperability
JP	Joint Point
LB	Installation space for length of the buffer stop
LL	Length of the locomotive
ML	Main line
MS	EU or EEA Member State
MU	Multiple Unit
OCC	Operation and Control Center
OCS	Overhead Contact System
OL	Open line
OP	Operational point
RINF	Register of Infrastructure
RS	Rolling Stock
RIS	Railway Infrastructure Schematic
SD	Signal sighting distance
SoL	Section of Line
ST	Safety track

Abbreviation	Definition
SvL	Supervised location
UIC	International Union of Railways (Union Internationale des Chemins de fer)
UL	Usable length of the Platform

## Definitions

The following terms are used throughout this document:

Term	Definition
At-grade junction	A at-grade junction (also known as level junction) is a railway junction that has a track configuration in which merging or crossing railroad lines provide track connections with each other that require trains to cross over in front of opposing traffic at grade (i.e. on the level).
Available track length	Track length between ETCS marker boards in stations.
Branch line	A branch line is a secondary railway line which branches off a more important through route, usually a main line. Branch lines may serve one or more industries, or a city or town not located on a main line.
Buffer stop	A buffer stop, (also known as bumper, bumping post, bumper block or stopblock), is a device to prevent railway vehicles from going past the end of a physical section of track.
Connecting line	Connecting lines are lines linking Operational points (OPs) to the main line.
Construction length of the platform	Is the physical length of the platform.
Crossover	Crossovers are pairs of turnouts on the open line or in within operational points where trains can transfer to another main line track on the same line.
Dead-end platform	Is a platform at a dead-end track which is usually equipped with a buffer stop.
Dead-end track	A dead-end track is a section of railway line that ends without connecting to any other track.
Emergency and Maintenance siding	Siding to allow parking of defective rolling stock, short-term parking of maintenance rolling stock and for rail/derail road-rail vehicles.
ETCS Marker board	Identifies the end of a block section requiring supplementary stopping information, indicates points the driver must not overpass without specific authorization in the absence of a Movement Authority (MA), and marks locations up to which the driver must confirm line clearance or proceed under his responsibility before receiving a possible MA in Full Supervision (FS) or On Sight (OS) mode.
Flank protection turnout	Additional turnouts to provide protection against overrunning and converging train movements from side tracks to the open line. Specifically required on high-speed lines.

Term	Definition
Flyover junction	A flyover junction (also known as grade-separated or flying junction) is a railway junction at which one or more diverging or converging tracks in a multiple-track route cross other tracks on the route by bridge to avoid conflict with other train movements.
Fouling point	Position in a turnout until a vehicle can be moved before the kinematic/dynamic reference profiles including the additional overthrows of the two adjacent tracks are overlapping, also working as a shunting limit.
Gauge crossing	Rail of different gauges (1520 and 1435 mm) are crossing at the same height.
Headshunt track	Is a usually terminating track with a connecting function in a station, which is used to pull vehicles out of a track with the purpose of transferring them to another track.
Heel Joint	End of the turnout of the diverging adjacent track and the main track.
Infrastructure facilities	In this document Infrastructure Facilities to be understood stations, crossovers, junctions. For Infrastructure maintenance facilities and rolling stock maintenance depots this guideline focus on defining requirements for access and connection to these facilities. Precise layout and dimension to be agreed upon by design contractor and RBR.
Infrastructure Manager	Any body or undertaking that is responsible in particular for establishing and maintaining railway infrastructure, or part thereof, as defined in article 3 of Directive 91/440/EEC, which may also include the management of infrastructure control and safety systems. The functions of the infrastructure manager on a network or part of a network may be allocated to different bodies or undertakings. (Article 3 (b) of Directive 2004/49/EC).
Joint point	Beginning of the turnout where the main track and the adjacent track meet/join or where the stock rail meets the switch rails.
Junction	A railway junction is a location in the railway network where two or more rail lines or tracks converge, diverge, or cross. It is a critical component of railway infrastructure, enabling trains to transfer from one track to another, facilitating the routing and directing of rail traffic across different lines and destinations.
Level crossing	A level crossing is an intersection where a railway line crosses a road, path, at the same level, as opposed to the railway line crossing over or under using an overpass or tunnel.
Main line	Double (or single in some limited cases) track system that is used for train traffic and it connects sidings, branch lines, etc.
Maximum train length	Is the maximum physical length of train that is possible at the platform including reserves for unprecise braking when stopping, signal sighting, stretching of trains and overlapping locomotives.
Multiple-unit train	A multiple-unit train or simply multiple unit (MU) is a self-propelled train composed of one or more carriages joined, which when coupled to another multiple unit can be controlled by a single driver, with multiple-unit train control.
Open line	The part of line between adjacent operational points which may consist of several tracks. Open line tracks are outside of the operational point.

Term	Definition
Operational Point	Any location for train service operations, where train services may begin and end or change route, and where passenger or freight services may be provided; 'operational point' means also any location at boundaries between Member States or infrastructure managers.
Operation and Control Centre	Operation Control Centre railway systems facilitate the monitoring and tracking of all railway operations, including train cars.
Overlap	An overlap in railway signalling is the length of track beyond a stop signal that is proved to be clear of vehicles in the controls of the previous signal, as a safety margin.
Passing loop	a section of track that allows two trains traveling in same (or opposite) directions to pass each other.
Physical track length	Technical available track length between fouling points of turnouts.
Protection section	A safety distance also called "stretching distance" behind a stopping passenger or freight train that allows the train to stretch into in case of reaccelerating against a negative gradient.
Rolling stock	Rolling stock describes all the vehicles that run on railway tracks. It usually includes both powered and unpowered vehicles, for example locomotives, hauled passenger vehicles and freight vehicles (coaches and wagons), diesel units, electric units.
Safety track	Safety tracks are the tracks behind flank protection turnouts to isolate vehicles from of overrunning on the open line or station through tracks. Safety tracks allow integration of Overlap and supervised location (SvL) of ETCS Movement authority (MA).
Shunting limit	Defined points on the track until train can be shunted without conflicting other train movements or kinematic/dynamic reference profiles including the necessary additional overthrows per track. This includes fouling points and joint points of turnouts, location of ETCS marker boards and position of axle counters etc.
Side track	A side track is used for passing and overtaking trains for example in Passing loops.
Siding	Siding means any track within an operational point, which is used for (overnight) stabling of rolling stock (parked passenger trains, locomotives, maintenance vehicles, wagon groups etc).
Station through tracks	Station through tracks are the tracks inside of an Operational Point (they are assigned to the open line tracks (south- and northbound, typically marked with an I and II).
Stopping marker	Plate that marks the precise stopping points for passenger trains of different lengths, in case no ETCS marker board marks the stopping point.
Usable length of the platform	The usable length of the Platform (UL) is the part of the platform that can be used for passenger entering and disembarking the passenger wagons, while the maximum train length includes not only the passenger wagons but also the length of coupled locomotives in case of locomotive hauled passenger trains.
Usable track length	Length that can be used for stopping trains; it excludes a margin for unprecise breaking (5 m), signal sighting of the marker board (5 m) and a safety margin for

Term	Definition
	stretching of trains, a so-called protection section (shown in Figure 14, between 5 and 15 m depending on the track gradient).

# 1 Scope

1. This Design Guideline is intended as a guiding document for the development and implementation of Rail Baltica global project. It establishes principles and parameters that must be coordinated between Rail Baltica RB Rail AS (RBR), third parties.
2. The updated Design Guideline reflects the advanced planning stage of the Rail Baltica project and aims to provide a more precise framework for designers, enabling better decision-making in accordance with project requirements and objectives.
3. As a consequence, this updated Design Guideline does not aim to redesign infrastructure that has already been designed but rather to support the effective completion and refinement of ongoing designs within the project's established framework. Already designed infrastructure and coordinated designs with RBR are not affected by this or future revision of this Guideline.

# 2 Operational Points

## 2.1 Types and definition of Operational point

4. The Registers of Infrastructure (RINF) standards are used to define operational points (OPs):

*An 'operational point' (OP) means any location for train service operations, where train services may begin and end or change route, and where passenger or freight services may be provided; 'operational point' also means any location at boundaries between Member States or infrastructure managers.<sup>1</sup>*

5. For Rail Baltica, the following types of operational points (OP) are being distinguished in the table below:

*Table 1: Definition of Operational points (OP)<sup>2</sup>*

Term	Code for OP type	Definition
Border point	B	Located in the point where a border between Member States meets a railway line.
Crossovers	O	Isolated group of turnouts on the open line, that allow trains in both directions to switch between right-hand running to left-hand running.
Domestic border point	I	A border point located exactly in the point where a border between IMs meets a railway line.
Freight terminal	F	Station dominantly serving for loading and unloading of freight trains

<sup>1</sup> Source: RINF Application guide V1.6.1 Chapter 2.3, Point (a), see also «Definitions»

<sup>2</sup> Source: RINF Application guide V1.6.1 Chapter 2.3.2

Term	Code for OP type	Definition
Halt	H	Small OP without turnouts, consisting of at least one platform on the open line, normally serving mostly for local passenger services. Can be unstaffed or with very few staff, and with few or no facilities.
Infrastructure Maintenance Facility	M	A local facility for infrastructure maintenance.
Junction	J	An arrangement of tracks and turnouts in which a line is joined by another one.
Passenger train stabling area	P	Area for stabling passenger train units
Passing Loop	L	Station with focus of overtaking slower trains by passenger trains. Passing loops can also allow connections to other facilities like private sidings.
Private siding	R	OP that describes the embranchment connected to the main line that leads to the private siding with the information regarding the embranchment characteristics.
Rolling Stock Maintenance Facility	D	Group of tracks and related facilities used by depot or workshop for RST maintenance.
Shunting yard	Y	Group of tracks used for shunting trains, mostly related to freight traffic.
Station	S	OP with more than one turnout. Facilities is used for scheduled traffic stops of passenger and freight trains as well as connection to other facilities and main and branch lines.
Technical change	C	OP to describe a change on traffic control ownership or a gauge changeover facility.
Train technical service	T	Group of tracks for servicing trains (parking, washing, etc.).
Turnout (Switch)	U	OP consisting of only one turnout. It describes a single turnout without any extension contrary to a junction that has a real spatial extension and is generally delimited by entry signals.
Vehicle Loading Station	V	A station, where vehicles can be loaded / unloaded to / from trains from the front/end via Head ramps.

Term	Code for OP type	Definition
Operation and Control Centre	Z	Operation Control Centre railway systems facilitate the monitoring and tracking of all railway operations, including train cars. <sup>3</sup>

- An OP will be presented by so called ‘centre point’, which determines the geographical coordinates (and the kilometre as per km-chainage numbering. It is important to note that this point is not always in the centre of the OP area (for details also check chapter 8.1). An OP is allowed to have no track (e.g., border points, technical change or OP private siding).

## 2.2 The Codification Operational Points

- The codification of the location of Operational Points shall be unique and consists of the two-letter code of the location and a third letter indicating the type of the Operational Points as shown in the table below:

*Table 2: Codification of the operational points*

<b>Numbering style</b>	Capital letters only
<b>Format</b>	XXX X <sub>1</sub> X <sub>2</sub> = Unique abbreviation of the operational point’s name X <sub>3</sub> = Type of operational point according to Table 1
<b>Number of symbols</b>	3 (three)
<b>Example</b>	Name of station is Saurieši: X <sub>1</sub> X <sub>2</sub> = SR Type of OP is Halt: X <sub>3</sub> = H Codification is SRH for Saurieši halt

- The “unique code” shall allow intuitive interpretation and prevent misinterpretations of the Operational Point’s geographic location (e.g. it is not allowed to use same code SL for Salacgrīva and Salaspils; SC to be used for Salacgrīva and SL for Salaspils). In cases for large infrastructure facilities (for example Muuga freight terminal, Kaunas triangle, Panevėžys...) different codifications or additional letters within one infrastructure facilities can be used – subject to coordination with RBR.
- The list of operational points and their codes are included in the approved RIS versions. In case of OP names change in future codification will remain the same.
- The abbreviation/codification of operational points remains unchanged in the event of renaming operational points.

<sup>3</sup> Included in the table for registering only.

### 3 General types of Stations

11. A train station is a railway facility where trains stop for onboarding and disembarking of passengers, to overtake freight trains, or both. In general a train station shall consist as a minimum of two platforms, two through tracks and two or more side tracks, and a station building providing ancillary services as ticket sales, waiting rooms, and baggage/freight service.
12. A Halt only consists of two platforms on the open line with limited basic necessary passenger facilities.
13. In some cases, Halts are combined with crossovers. In this case they are considered as regional station, because it is technically possible to terminate and begin a train route and change the track and direction of the train (see also Figure 2).
14. For the overall architectural design of passenger stations please refer to RBDG-MAN-031B.
15. In general, stations are classified in four groups:
  - a. **Halt** (stopping point on the open line – only consisting of platforms without any turnouts – used for smaller passenger stops with nominal 210 m long regional passenger platforms);
  - b. **Passing loop** (mainly used for stopping of 1,050 m long freight trains to be overtaken by faster passenger trains);
  - c. **Regional passenger station** (with nominal 210 m long passenger platforms for regional passenger train services and 1,050 m long freight trains). Selected regional stations can also have shorter side tracks – not suitable for 1,050 m long freight trains;
  - d. **International passenger station** (with nominal 405 m long passenger platforms for international and regional passenger train services but possibly also for 1,050 m long freight trains – if side and main tracks are designed with sufficient usable length);

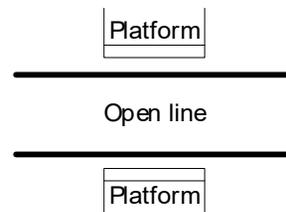


Figure 1: Halt on the open line

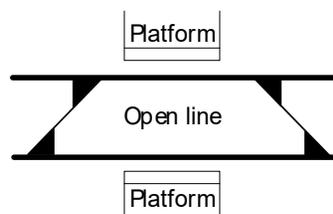


Figure 2: Regional Station with Crossovers

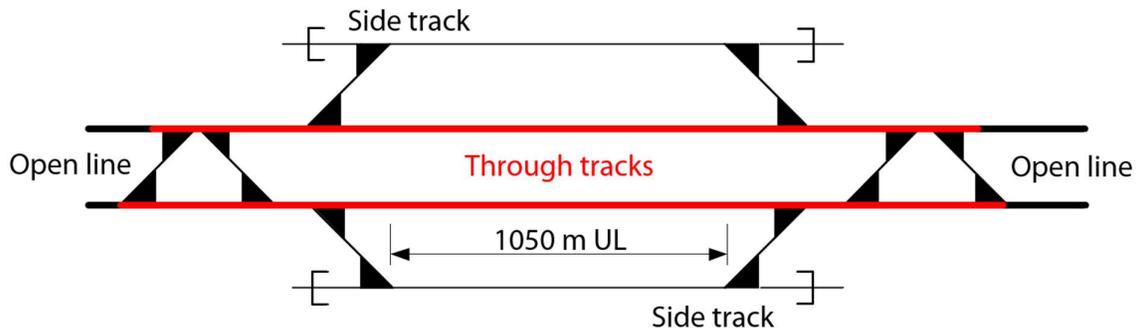


Figure 3: Schematical track layout for a Passing Loop

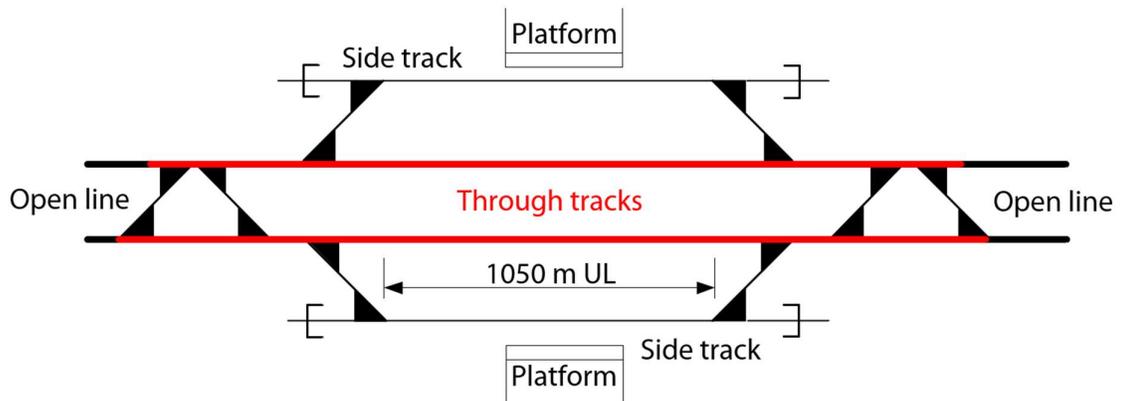


Figure 4: Regional and international station with one side track per direction for 200 m or 400 m long passenger trains and 1.050 m long freight trains

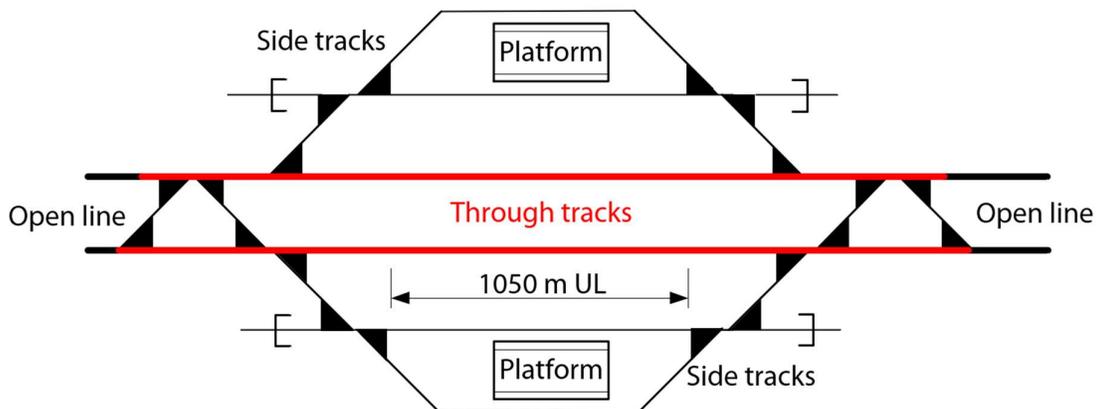


Figure 5: Regional and international station with two side tracks per direction for parallel stop of 200 m long regional and 400 m long international passenger service and/or 1.050 m long freight trains

16. Side tracks shall be separated from the station through tracks by flank protection turnouts. Flank protection turnouts can be designed for a lower speed.<sup>4</sup> Side tracks shall be designed for a design speed of 100 km/h. Slower speeds can be applied – due to spatial constraints, subject to coordination with RBR and Application of derogation from Design Guidelines.
17. It shall be noted that the design of a typical station track layout shall allow to retain 1,050 m long freight trains on side tracks and through tracks of the station. This allows freight trains to be overtaken by passenger trains, flexibly routed via the through tracks or side tracks of the station.
18. Full crossovers (as seen in Figure 5 above, consisting of 4 turnouts) shall be foreseen on each station end with a design speed 100 km/h. Slower speed of 80 km/h can be applied due to spatial constraints, subject to coordination with RBR and Application of derogation from Design Guidelines.
19. Also, stations shall be designed in a symmetrical basis to allow identical operational conditions, capacity, and travel times in both directions.<sup>5</sup>
20. Platforms shall be located between the turnouts (usually in the middle of the side track) in a way, to allow optimal entry- and exit-speeds over the turnouts and minimize the overall travel time of passenger trains.
21. The table below defines the general characteristics of mentioned group of stations. A more detailed description will be provided in the following sections.

*Table 3 General characteristics for Stations and Halts*

Station type	Platforms***	Side tracks*	Flank protection	Design speed
Halts	210 m	No	No	Open line: 249 km/h
Regional stations	210 m	1,050 m**	Yes	Open line/Through tracks: 249 km/h Side tracks: 100 km/h
International stations	405 m	1,050 m		
Passing loops	No	1,050 m		

<sup>4</sup> For more details for flank protection, please check chapter 4.3.

<sup>5</sup> Details for full or reduced scope of crossover please see also chapter 6.1.

\* Usable length of side track as defined in chapter 4.1  
 \*\* Regional stations can have a reduced length for side tracks focusing on passenger services only – subject to coordination with RBR  
 \*\*\* Please see also chapter 5 for detailed assessment of platform requirements

# 4 Detailed dimensions and parameters of stations

## 4.1 Station through track and side track dimensions

22. In general, three different types of track lengths must be considered for station design (shown in the table below):

No.	Name	Description
1	<b>Physical</b> track length	Technical available track length between fouling points of turnouts.
2	<b>Available</b> track length	Track length between ETCS marker boards in stations
3	<b>Usable</b> track length	Length that can be used for stopping trains; it excludes a margin for unprecise breaking (5 m), signal sighting of the marker board (5 m) and a safety margin for stretching of trains, a so called protection section (shown in Figure 6, between 5 and 15 m in length depending on the track gradient).

*Table 4: Type of track lengths*

23. The types of track lengths are depicted in Figures below for Station through tracks, side tracks and tracks located in emergency and maintenance sidings (EMS) and safety tracks (ST) located behind flank protection turnouts.

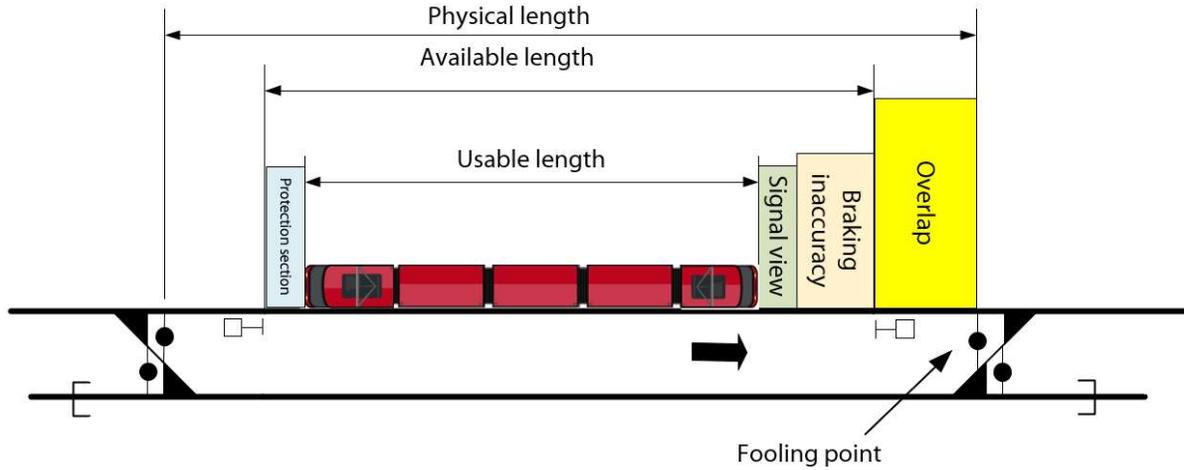
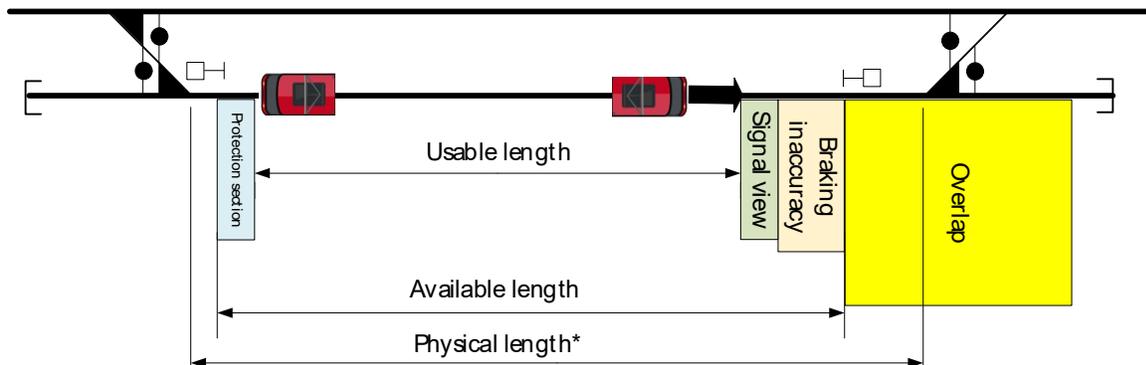


Figure 6: Train stopping at the station through track inside a station



\* The physical length shall include 10 m clearance between the joint point of the turnout and location of the signal in each siding

Figure 7: Train stopping on a side track inside a station

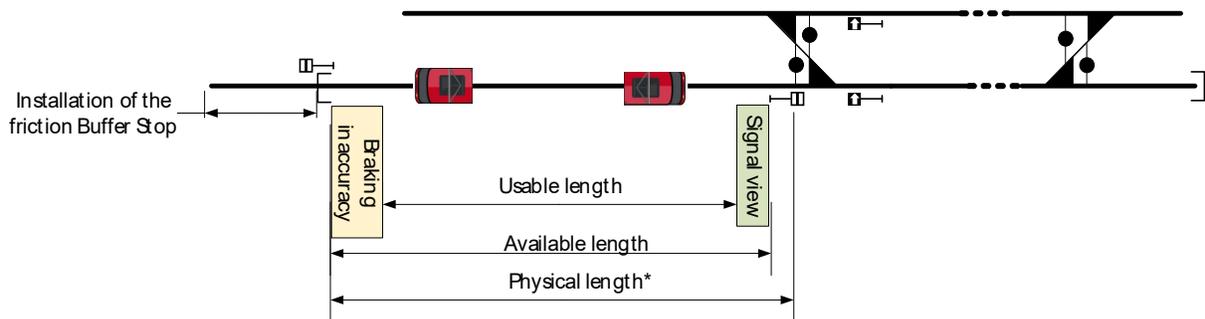


Figure 8: Train stabled on an emergency and maintenance siding or a safety track

24. The available track length is defined considering the signalling system planned to be installed. For through tracks, the available track length is defined as a distance between the ETCS marker board or start signal for the specific direction and the ETCS marker board or start signal for the opposite direction. A detailed

assessment for how to consider the correct location of the ETCS marker boards are being defined in the previous section 4.1.

25. The reserve for train stretching (protection section, as shown in Figure 6 and Figure 7 above) compensates the stretching of a 1,050 m long freight train. Compressing of the couplers between the freight wagons of the freight train, occurs during the braking and deceleration process and remains when the train has stopped, and the main train brakes stay applied. During the departure process when the brakes of the wagons are released the wagons are accelerated against a negative gradient. This stretches the wagons into the opposite direction. The maximal distance of the train stretching depends on the train length and the gradient of the track. Considering a train length of 1,050 m and the European practice, the length of protection sections shall be at least:

Negative track gradient, ‰	Protection section length, m
0	5
1	6
1,5	7
2 - 3	9
4 - 5	10
6 - 7	11
8 - 11	13
≥ 12	15

Table 5: Protection section length

26. The reserve for braking inaccuracy shall consider possible inaccuracy of the end position of the train after braking. The distance of 5 m represents the regular value according to European practice.
27. The reserve for signal view is required in front of the ETCS marker board or signal. It allows the train driver to see the respective indication and identification marking. The distance of 5 m represents the regular value according to European practice and shall be considered by designers.

## 4.2 Typical track layouts and dimensions

28. In this section the elements (listed below) that are located around the heel joint and the fouling points of turnouts are being defined. These elements define the **available track lengths**, and the space and location of platforms between turnouts in stations.
- Axle counters shall be placed in 10 m distance to the heel joint or the fouling point of the turnout.
  - Location of ETCS-Marker boards shall be placed 70 m away from danger points (distance of supervised location SvL) or on the identical location of the axle counter in case of SvL location via a flank protection turnout.
  - Position of stopping boards (or considered minimum stopping distance of the train) 10 m in front from the ETCS marker boards consisting of 5 m for signal view and 5 m for braking inaccuracy.
  - At the end of dead-end track sufficient space for installation of the Buffer stop shall be foreseen (see also latest version of RBDG 14E)

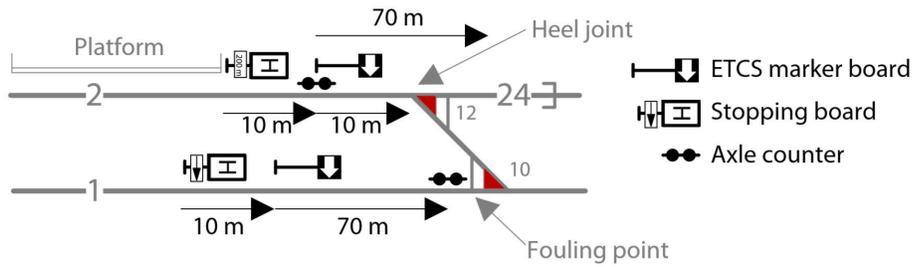


Figure 9: Detailed alignment of station elements around turnouts (objects only indicative)

29. In case the precise location of the turnouts from the next axle counters can be clearly defined (for example after completion of construction), the distances mentioned above in the figure can be reduced.
30. In general, the following different situations define the typical track length for stopping trains:
- on a **station through track** (shown in Figure 10 below)
  - on a **side track with use of the flank protection** (shown in Figure 11 below)
  - on a **side track without using the flank protection turnouts** (shown in Figure 12 below, left side)
  - in an **emergency and maintenance siding track** behind the flank protection turnout of the train station side track (see also in Figure 13)

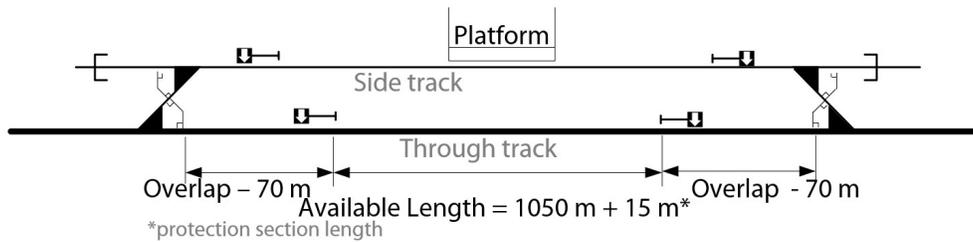


Figure 10: Elements and lengths of station through track between turnouts in stations

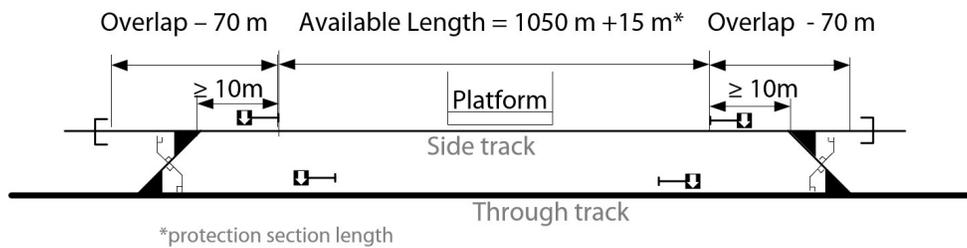


Figure 11: Elements and lengths of station side track between turnouts in stations

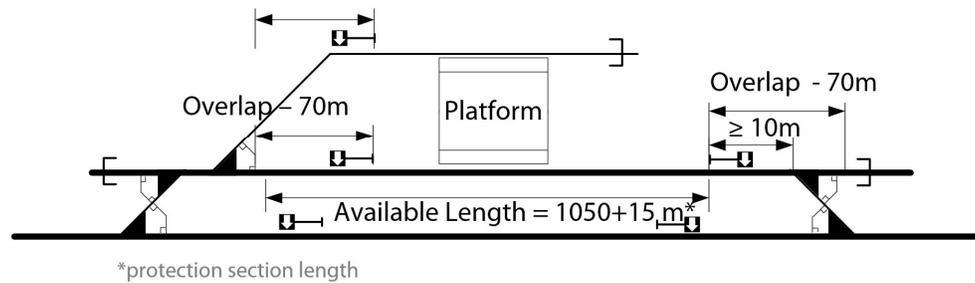


Figure 12: Case of additional side track in stations (for example additional dead-end side track)

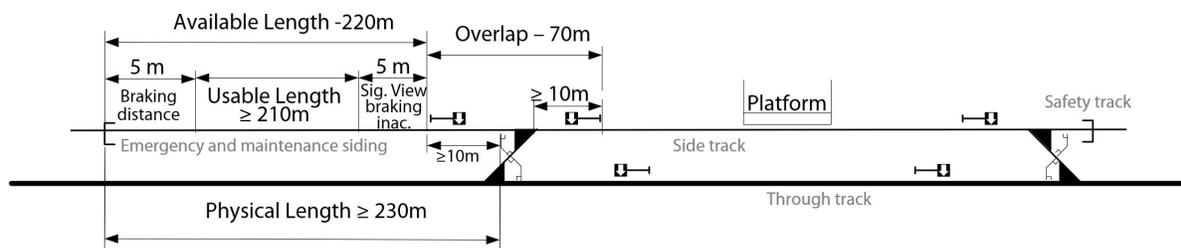


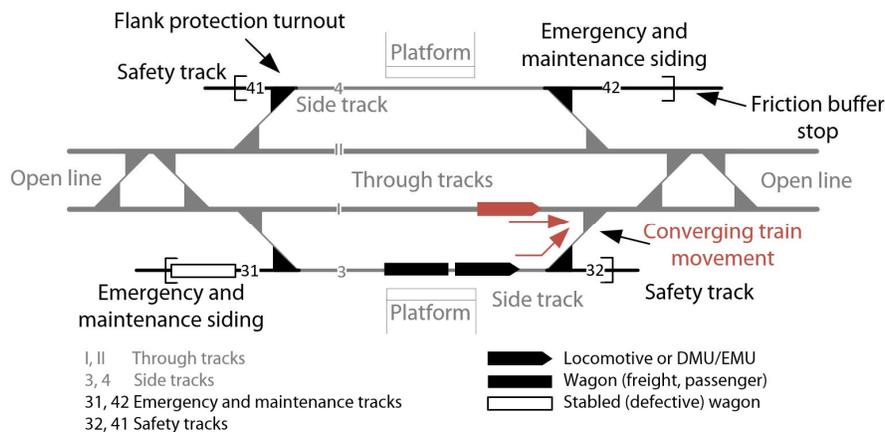
Figure 13: Side tracks in stations for short-term parking of vehicles in the emergency and maintenance siding

## 4.3 Emergency and maintenance sidings and safety tracks in stations

31. The side tracks of stations shall be designed with adjacent “emergency and maintenance sidings” and “safety tracks” located behind the flank protection turnouts of the side track (see also Figure 14).
32. **Safety tracks** protect open line trains against overrunning and converging train movements (see also Figure 14 below) from side tracks. They isolate parked trains on side tracks and sidings in stations from accidentally rolling on the open line and colliding with trains with speed of up to 249 km/h.
  - a. They shall be used to maximise the usable length of stopping trains on side tracks by extending the Overlap behind the ETCS-marker board into the safety track.
  - b. Additionally, safety tracks shall have a usable length of 20-50 m to allow short-term parking of locomotives and maintenance vehicles. Local situations may vary - subject to coordination with RBR.
  - c. In general, safety tracks shall not be occupied by vehicles to be used for open line operations.
33. Main purpose of **emergency and maintenance sidings** is the parking of defective rolling stock which cannot be moved to a depot or suitable station without repair or temporary parking of maintenance vehicles.<sup>6</sup>
  - a. Where feasible, emergency and maintenance sidings shall be allocated in every station and passing loop.

<sup>6</sup> See also Operational Plan (2018), chapter 3.4.1

- b. Where feasible the siding shall be placed in such a way, that defective wagons can be pushed into the siding without the need to shunt the locomotive to the other end of the train (location behind the freight train in main driving direction).
- c. Emergency and maintenance sidings shall have a nominal usable length of at least 220 m, suitable for parking of a multiple unit for passenger service and need to park selected freight wagons and maintenance vehicles. In exceptional cases (e.g. because of spatial restraints...) also a minimum usable length of 210 m is possible.
- d. Emergency and maintenance sidings shall be foreseen at least every 50 km – subject to coordination with RBR and based on operational requirements.



- 34. It shall be noted that dead-end tracks have to be designed with buffer stops. In most cases buffer stops are designed as friction buffer stops (shown in the figure above) and need a certain track length themselves as a braking distance to absorb the kinetic energy of impacting trains in case of incorrect braking.
- 35. For specific required track length for the installation of buffer stops please see also latest RBDG-MAN-014E.

## 4.4 Emergency Platform

- 36. In coordination with RBR selected stops are/shall foreseen with 405 m long “emergency platforms” for stopping of international passenger service up to 445 m in length when operation in double traction.
- 37. After coordination, these stations:
  - a. Assaku halt (ASH) – last passenger stop before Tallinn central station (only foreseen as option for 405 m)
  - b. Daugavkrasti halt (DAH) – bypass passenger stop for the Riga node area
  - c. Lentvaris halt (LEH) – last passenger stop before the Vilnius central station
  - d. Palemonas halt (PAH) – last stop for bypassing Kaunas central station and the 1520/1435 mm dual-gauge tunnel

Are currently foreseen for stopping of international trains service when traffic through or until the main central station in Tallinn, Riga, Kaunas and Vilnius is not possible – due to (un-)planned events/maintenance. In this case internal services can be rerouted with temporary passenger stop outside the node area.

## 4.5 Overhead Contact System

38. The locations of OCS poles and anchoring foundations shall be determined by the System designer. In the case that the System designer is not available the structural designer (responsible for INF) shall prepare a conceptual OCS layout. The conditions for this conceptual design are described in RBDG-MAN-019. The conceptual
39. OCS design shall cover the following design solutions:
- a. Catenary wiring;
  - b. OCS foundation / pole (including anchors) locations;
  - c. Portals (where needed);
  - d. Cross-sections of critical interfaces to civil structures;
  - e. Additional feeder and/or return current wiring;
40. OCS anchoring can be integrated (where needed) in the facility structures

# 5 Length of passenger station platforms

41. For the nominal values for platform construction length are provided in the table below:

Station type	Min. Platform Usable length	Min. Platform nominal construction length	Maximum length of train <sup>7</sup>
Halts	200 m	210 m	245
Regional stations	200 m	210 m	245
International stations	400 m	405 m	445

*Table 6: Usable / nominal platform length / Maximum length of train*

42. The **construction length of the platform** is defined by the longest train type to be served. The construction-length of the platform is including several reserves for:
- a. SD: Signal sighting distance of 5 m
  - b. BA: Braking inaccuracy of 5 m

<sup>7</sup> Cannot be always guaranteed. Depending on the specific track layout of the station.

- c. LL: Length of the locomotive in case of locomotive hauled train (typically 20 m)
- d. LB: Installation space for length of the buffer stop of up to 20 m (see also RBDG-MAN-102-014E)
- e. CS: For coupling and uncoupling of MU´s at the passenger platform a space between the coupling trains (CS) of 5 m shall be reserved.

43. The general dimension of different passenger platforms for MU and locomotive hauled trains apply as shown in the figures below.

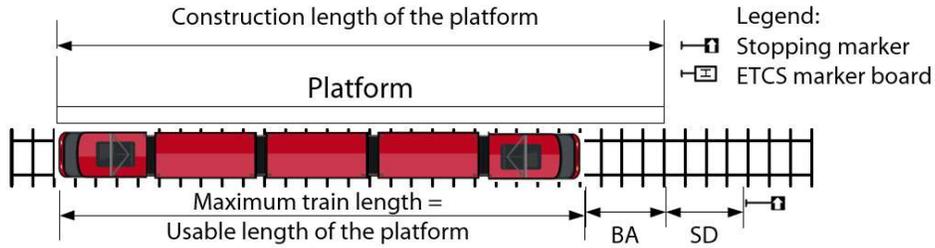


Figure 15: Construction length of through track platform for MU

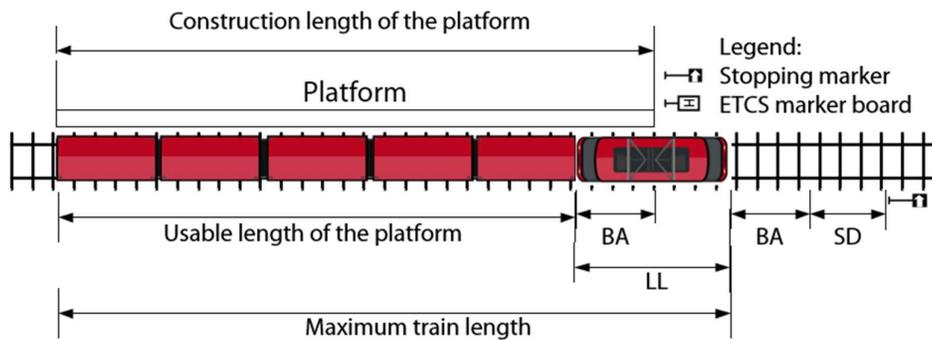


Figure 16: Construction length of through platform for locomotive hauled train only with ETCS-marker board

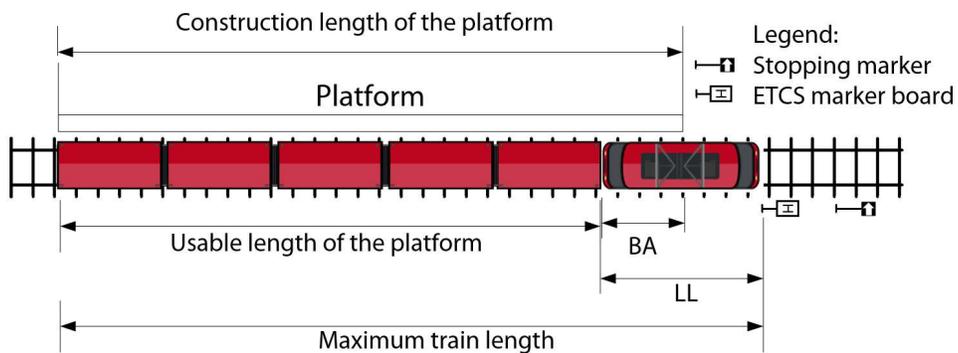


Figure 17: Construction length of through platform for locomotive hauled train with extra Stopping marker

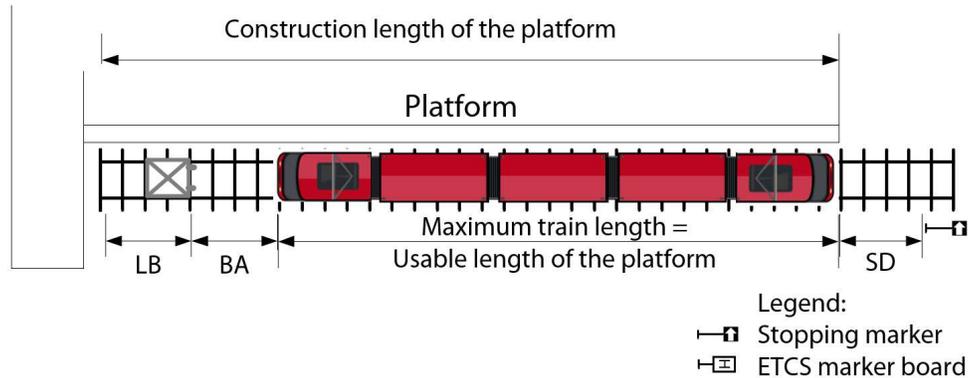


Figure 18: Construction length of dead-end platform for MU

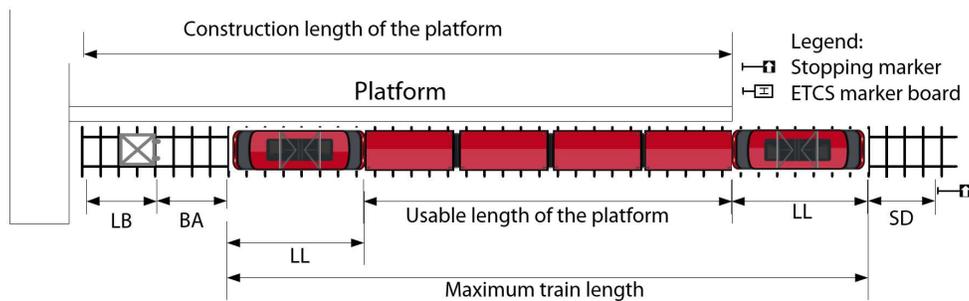


Figure 19: Construction length of a dead-end platform for a locomotive hauled train

44. **Technically longer trains at the platform** with nominal platform length of 210/405 m are possible (see also Figure 20). If possible, axle counters and ETCS marker boards are placed in a way to allow extra 20 m (LL) on both ends of the platform for overlapping EMU and locomotives under the condition that the doors are still on the platform area (205 m) minus the BA (5 m). Then the maximum lengths shown in Table 6 are possible.

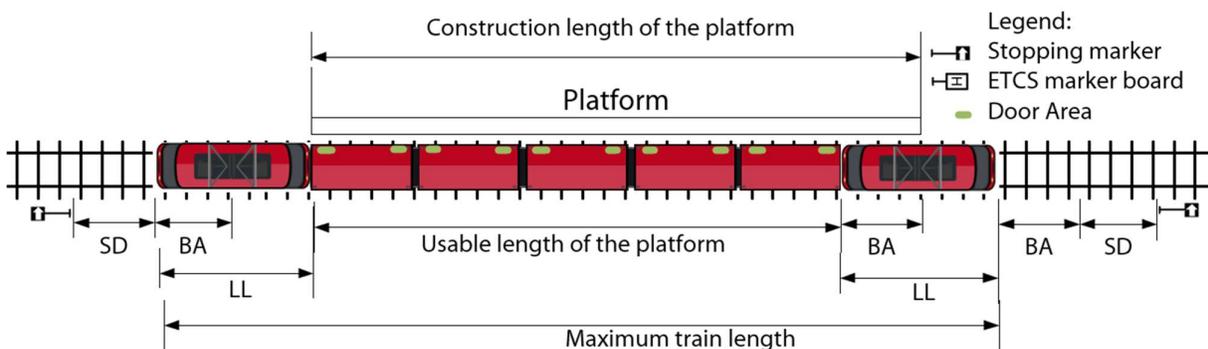


Figure 20: Maximum length of trains overlapping the platform

45. **Coupling and un-coupling of passenger trains:** passenger trains – when operating in full length- often consist of multiple units. In some cases, coupling or uncoupling of MU is being carried out at the passenger platform and not only in sidings. For Rail Baltica the following cases shall be considered:

- a. International services may consist of two 200 m long units forming a 400 m maximum length high-speed train.
  - b. Regional trains may consist of two 100 m long units forming a 200 m maximum length regional train.<sup>8</sup>
46. The required construction length of the platform depends also on the chosen configuration of the coupling train parts. In Figure 21 below the configuration for two 100 m long regional train MU is shown. For a nominal construction length of the platform of 210 m, a space for braking inaccuracies (BA) of 5 m for the first unit and reserve for the Coupling section (CS) of 5 m shall be foreseen. After coupling of the MU the whole 200 m long train shall fit into the 210 m long platform.
47. This alignment shall allow coupling of two 100 m long MU in both directions.
48. In this guideline the standard situation of two up to 100 m long MU shall be highlighted only. However, for different MU configurations the platform can be divided into specific sections for (un-)coupling – subject to coordination with RBR. This can also result in overlapping train configurations. Overlapping of EMU or trains with locomotives are possible as long as the doors are still on the platform.

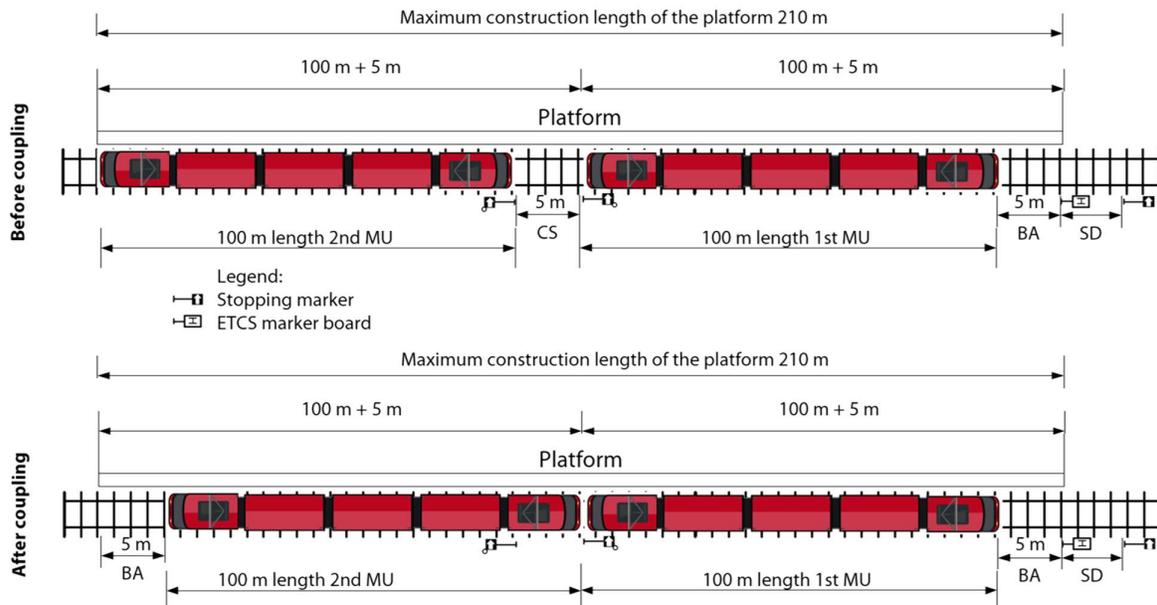


Figure 21: Coupling process for regional trains on 210 m long platforms for two 100 m long MUs

<sup>8</sup> In case of regional trains, single-units often have different lengths like 30, 40 m, 80 m or longer, resulting in different maximum train lengths and coupling combinations.

# 6 Crossovers and junctions

## 6.1 Design and function of crossovers

49. In general, crossovers shall fulfil the following design parameters:

- a. At least every 20-25 km a crossover shall be foreseen to provide the ability to divert trains from one main track to another (as separate OP or as part of a station like a passenger station or a passing loop).
- b. The design speed of the turnouts shall be 100 km/h. If – for example due to spatial restraints – no design speed of 100 km/h is possible a reduced speed of 80 km/h can be foreseen as exceptional value, subject to coordination with RBR.
- c. One full Crossover OP shall consist of four turnouts with an identical design speed and mirrored symmetrical alignment of two crossovers (see Figure 22).
- d. A full crossover shall be foreseen at each end of a station before/after the first turnout connecting the main track to the side tracks (see also Figure 23 and Figure 24)
- e. A full crossover shall be foreseen at the beginning of every junction and triangles (see also Figure 27).
- f. A symmetric design shall be applied to allow identical travel times and capacity, independent of direction and route of the train as much as possible.



Figure 22: Crossover on the open line



Figure 23: Crossovers (Full Crossovers) in stations (regional and international stations and passing loops)

50. **Reduced scope of Crossovers (half crossover).** Due to spatial restraints a reduced number of crossovers with mirrored alignment can be foreseen in an OP (see also figure below). Orientation of the crossovers is subject to coordination with RBR based on operational requirement for the OP.



Figure 24: Reduced scope of crossovers (Half Crossovers)

## 6.2 Alignment and types of junctions

51. A railway junction is an operational point in the railway network where two or more rail lines or tracks converge, diverge, or cross. Each junction shall be designed separately in coordination with RBR to define the operational requirements of each junction in regard of:

- a. **Design speed** of main corridor and bypass/branch line track
- b. **Single and/or double track design** of diverging corridors
- c. **At-grade of grade separated** design of diverging corridors
- d. **Speed of turnouts** of diverging corridors
- e. **Scope of crossover** around the junction for maintenance and degraded operations

52. So far the following design parameters for the junctions have been coordinated with RBR:

Table 7: Selection of most important junction on the Rail Baltica (not complete list)

No.	Junction	Desing speed Main corridor/branch	Track design Main corridor/branch	Corridor separation	Crossovers design
1	Upeslejas triangle north junction (UPJ)	250 km/h (RB01)/ 160 km/h (RB03)	Double track/ Double track	Grade separated	Full crossover (100 km/h)
2	Upeslejas triangle south junction (TSJ)	250 km/h (RB03)/ 100 km/h (RB04)	Double track/single track	At-grade	Simple crossover (100 km/h)
3	Upeslejas triangle west junction (UWJ)	250 km/h (RB01)/ 100 km/h (RB04)	Double track/single track	At-grade	Simple crossover (100 km/h)
4	Misa triangle South junction (MSJ)	250 km/h (RB01)/ 160 km/h (RB03)	Double track/ Double track	Grade separated	Full crossover (100 km/h)

5	Misa triangle North junction (MNJ)	250 km/h (RB03)/ 100 km/h (RB05)	Double track/single track	At-grade	Simple crossover (100 km/h)
6	Misa triangle West junction (MWJ)	250 km/h (RB01)/ 100 km/h (RB05)	Double track/single track	At-grade	Simple crossover (100 km/h)
7	Panevėžys North junction (PCJ)	250 km/h (RB01)/ 230 km/h (RB15)	Double track/ Double track	Grade separated	Full crossover (100 km/h)
8	Panevėžys South junction (PEJ)	250 km/h (RB01)/ 230 km/h (RB15)	Double track/ Double track	Grade separated	Full crossover (100 km/h)
9	Kaunas triangle north junction (KNJ)	250 km/h (RB01)/ 170 km/h (RB07)	Double track/ Double track	Grade separated	Full crossover (100 km/h)
10	Kaunas triangle East junction (KEJ)  <i>Junction To Kaunas airport</i>	160 km/h (RB06)/ 170 km/h (RB07)  <i>160 km/h (RB06)/ 160 km/h (RB16)</i>	Double track/ Double track  <i>Double track/ Single track</i>	Grade separated  <i>At-grade</i>	-  <i>Simple crossover (100 km/h)</i>
11	Karmėlava station (KRS) <sup>9</sup>	250 km/h (RB01)/ 160 km/h (RB06)	Double track/ Double track	Grade separated	Simple crossover (100 km/h)
12	Palemonas south junction (PLJ)	250 km/h (RB01)/ 100 km/h (RB08)	Double track/ Double track	Grade separated	Full crossover (100 km/h)
13	Jiesia junction (JIJ)	250 km/h (RB01)/ 100 km/h (RB08)	Double track/ Double track	Grade separated	Full crossover (100 km/h)
14	Marijampole North Junction (MJJ)	250 km/h (RB01)/ 100 km/h (RB13)	Double track/ Double track	Grade separated	Full crossover (100 km/h)
15	Brukai station (BRS) <sup>10</sup>	250 km/h (RB01)/ 120 km/h (RB14)	Double track/ Double track	Grade separated	Simple Crossover (100 km/h)

<sup>9</sup> Karmėlava station is including the Kaunas triangle south junction

<sup>10</sup> Brukai Passing loop and Marijampole South Junction have been merged to Brukai station

53. In general, junctions shall be designed to **allow double-track and grade separated operations** from and to the diverging corridors from the main corridor (flyover junction). This means:
- a. All corridors shall be designed as double-track and
  - b. No conflicting train movements shall be possible

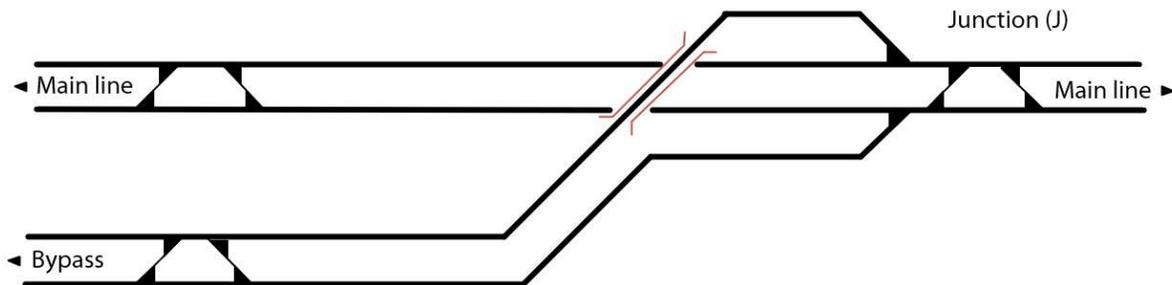


Figure 25: Double-track and grade separated junction (including crossovers)

54. In specific cases junctions can be designed without fully fulfilling all the main requirements (derogation needed) to avoid the need of flyovers/underpasses or to reduce the number of turnouts. This can include:
- a. Partial single-track instead of double-track design
  - b. At-grade branching in and out of corridors, bypasses and branch lines (for example the branch line connection North and south junction in Figure 27).
55. Several junctions also form complex triangles (for example Kaunas triangle) where three grade-separated, double track junctions form a triangle to allow double-track operation between two connecting corridors without change of direction of trains and at-grade crossing of tracks in the opposite direction.

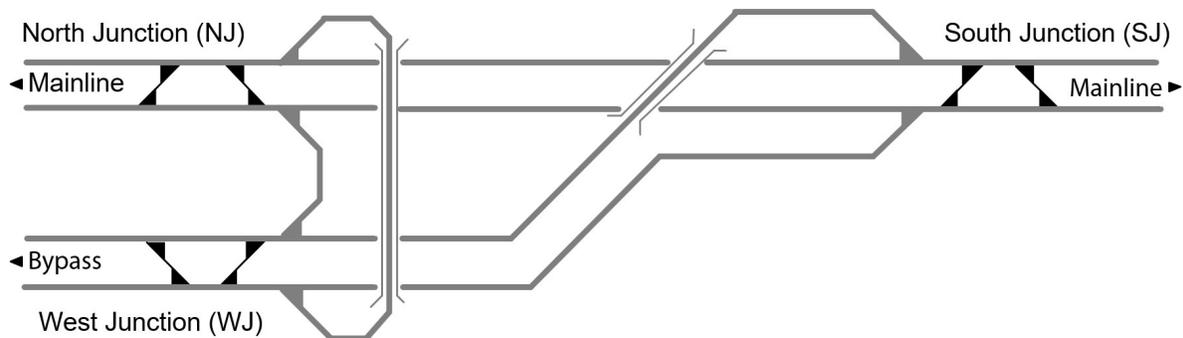


Figure 26: Complete Triangle with three grade separated free double-track design junctions (Crossovers in black)<sup>11</sup>

56. In case of lower priority train movements or expected lower number of trains between connecting corridors, triangles can be simplified. As shown in the figure below, connection between corridors can also partly be designed as single-track and at-grade (e.g. Misa and Upeslejas Triangle).

<sup>11</sup> Crossovers highlighted in black, are required for degraded operations.

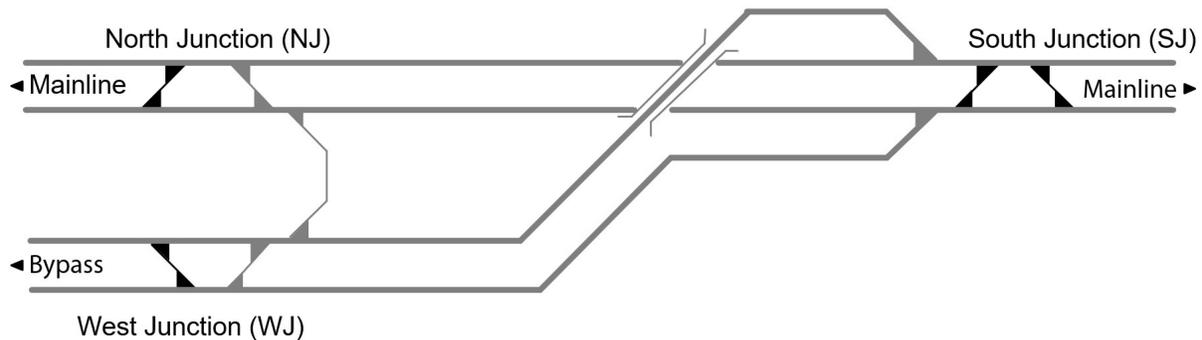


Figure 27: Reduced triangle with one single-track at-grade line between the north and west junction<sup>12</sup>

57. Crossovers highlighted in black in the Figure 26 and Figure 27 above, are required for degraded operations, while the grey marked crossovers in Figure 27 are required for normal operations of trains routed via the west and north junction.

## 7 Access to other facilities outside the main line

58. This chapter refers to:

- a. Infrastructure maintenance facilities (IMF),
- b. Rolling stock depots for maintaining trains (light & heavy maintenance, cleaning, inspections...),
- c. Sidings for stabling and overnight parking of rolling stock (trains, MUs, locomotives...),

and focuses on defining requirements for access and connection to these facilities. Precise layout and dimension to be agreed upon by design contractor and RBR.

59. In general, connections to other facilities (mentioned above) connected to the open line or integrated into operational points shall be designed in a way to not reduce the operational capacity or flexibility of the main corridor.

60. As shown in the figure below, the station through tracks and side tracks are already reserved for mixed open line service such as

- a. through running passenger and freight trains and,
- b. scheduled or dispositive passenger stops of regional passenger train stops or/and,
- c. the overtaking of freight trains including the use of the Overlaps/SvL on side tracks with and without platforms (depending of the design of the station).

<sup>12</sup> Crossovers highlighted in black, are required for degraded operations, while the grey marked crossovers are required for normal operations of trains routed via the west and north junction.

61. Therefore, the access to larger facilities adjacent to the main corridor shall be designed in a way to minimize the occupation of these station tracks from:
- Passenger and freight trains entering and leaving these adjacent facilities, switching between open line mode service to local trains movement mode (shown in Figure 29 below).
  - Separate the station from local shunting movements within the facility.
  - Avoid shunting movements or change of direction on the station through tracks and side tracks.

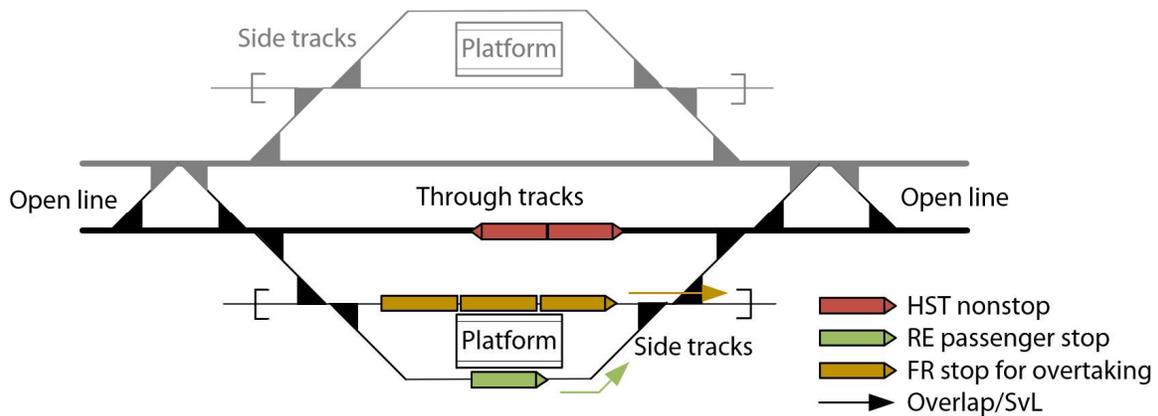


Figure 28: Tracks inside station foreseen for open line services.

62. Consequently, as shown in Figure 29 below, the adjacent facilities (in this case two private sidings 1 & 2) shall have:
- A **separate enter & exit track** that shall allow the stop of the maximum foreseen length of passenger/freight train for the adjacent facility.<sup>13</sup> This allows to keep the side track of the station free for open line operations.
  - Also, in case that the siding tracks cannot be reached directly or only with change of direction from the entry/exit track, a **headshunt track for the maximum planned train length** shall be foreseen (see private siding 1).
  - In case no change of direction is necessary the headshunt track shall be designed in a way to allow at least the parking of one or more open line or shunting locomotives (usable length 20 or 40 m).
  - Also, adjacent facilities shall be separated from the main line station tracks with a separate protection turnout and at least a safety track to cover the shunting movements.
  - Also connecting turnouts to/from the entry/exit track shall allow design speeds of 100 km/h (80 km/h exceptional value – subject to coordination with RBR) to not reduce the capacity utilization of – especially for longer freight trains – entering/ leaving the adjacent facility.

<sup>13</sup> Ideally the maximum possible lengths for freight trains (1,050 m) or passenger trains in case of a rolling stock depot (200 m or 400 m length)

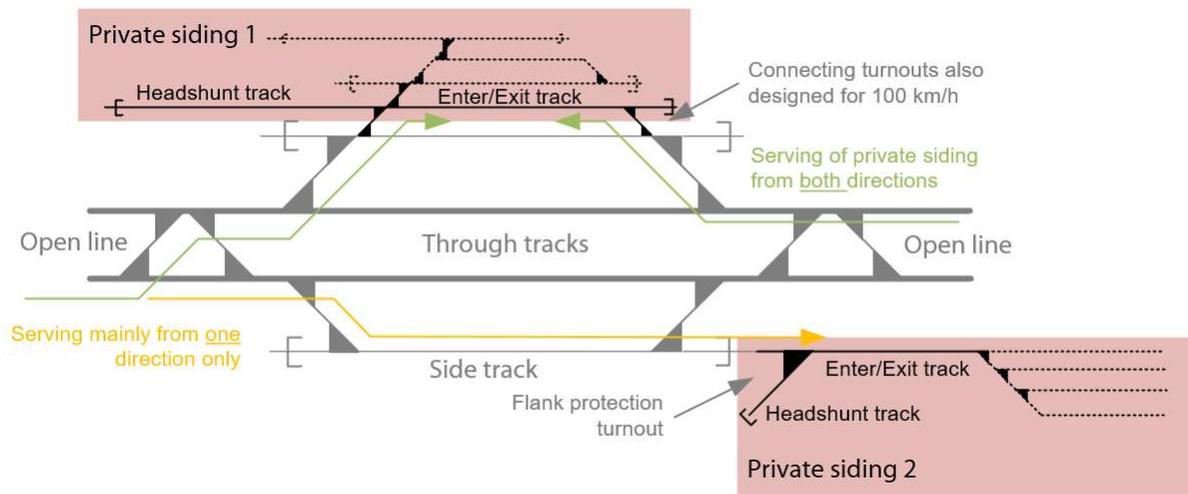


Figure 29: Example of connections of adjacent facilities in a typical station (passing loop)

63. In case when sidings are connected via the safety track behind the flank protection turnout (Private Siding 2) it shall be considered that the main direction of trains serving shall be decided beforehand to avoid shunting and change of direction – especially of locomotive-hauled trains – on the open line or the station on regular basis. Ideally the main direction shall be aligned with the next bigger freight terminal and/or shunting yard.
64. For specialised solutions for example for Rolling stop depots on highly occupied lines (as shown below), dedicated enter/exit tracks between the main line tracks shall be foreseen. They shall:
  - a. have a service platform so that passengers’ trains can switch between passenger operation mode and shunting mode including all procedures for the staff onboard.
  - b. Allow to synchronize the trains with available timeslots on the open line before entering/leaving the adjacent facility on highly occupied lines without blocking the open line capacity.
  - c. Designed in a symmetric way to allow identical operation conditions for leaving/entering the adjacent facility in both directions.

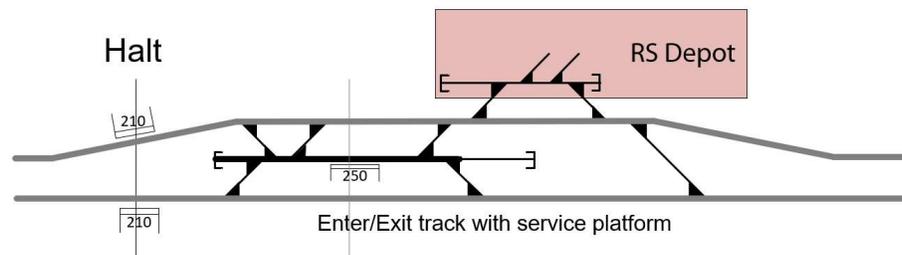


Figure 30: Example of private siding with specialized Entry/Exit track for rolling stock depot

65. In case of limited level of traffic, construction of flyover to access or exit from the adjacent facilities may be not justified. Consequently, a speed of 100 km/h (80 km/h exceptional value – subject to coordination with RBR) at grade junction is recommended. The exact requirements for the design speed of turnouts to/from the adjacent facilities shall be defined by the operation plan and coordinated with RBR.

## 8 Numeration of lines

66. Numeration of Rail Baltica main lines shall be applied according to the line concept depicted in Figure 31 below including the highlighted increasing km-chainage.
67. This numeration concept defines that chainage numbering for the main line (Line 1) starts from Tallinn-Ülemiste station; the numbering direction is from the North to the South and located on tracks 1.
68. For corridors diverging from the main line, the chainage starts at the connection point to the main line (beginning of the (diverging) turnout = 0+000,000 km) and the chainage for the line is again defined by track 1. For detail, please check Figure 32 and Figure 33.
69. One exception is line 6, where km-direction is from Vilnius to Kaunas triangle but also km-chainage of the line defined by track number 1.
70. For a detailed assessment of the railway infrastructure please check the latest version of the Railway Infrastructure Schematic (RIS, RBDN-SOD-ZZ-ZZ-DRW-R-00001).

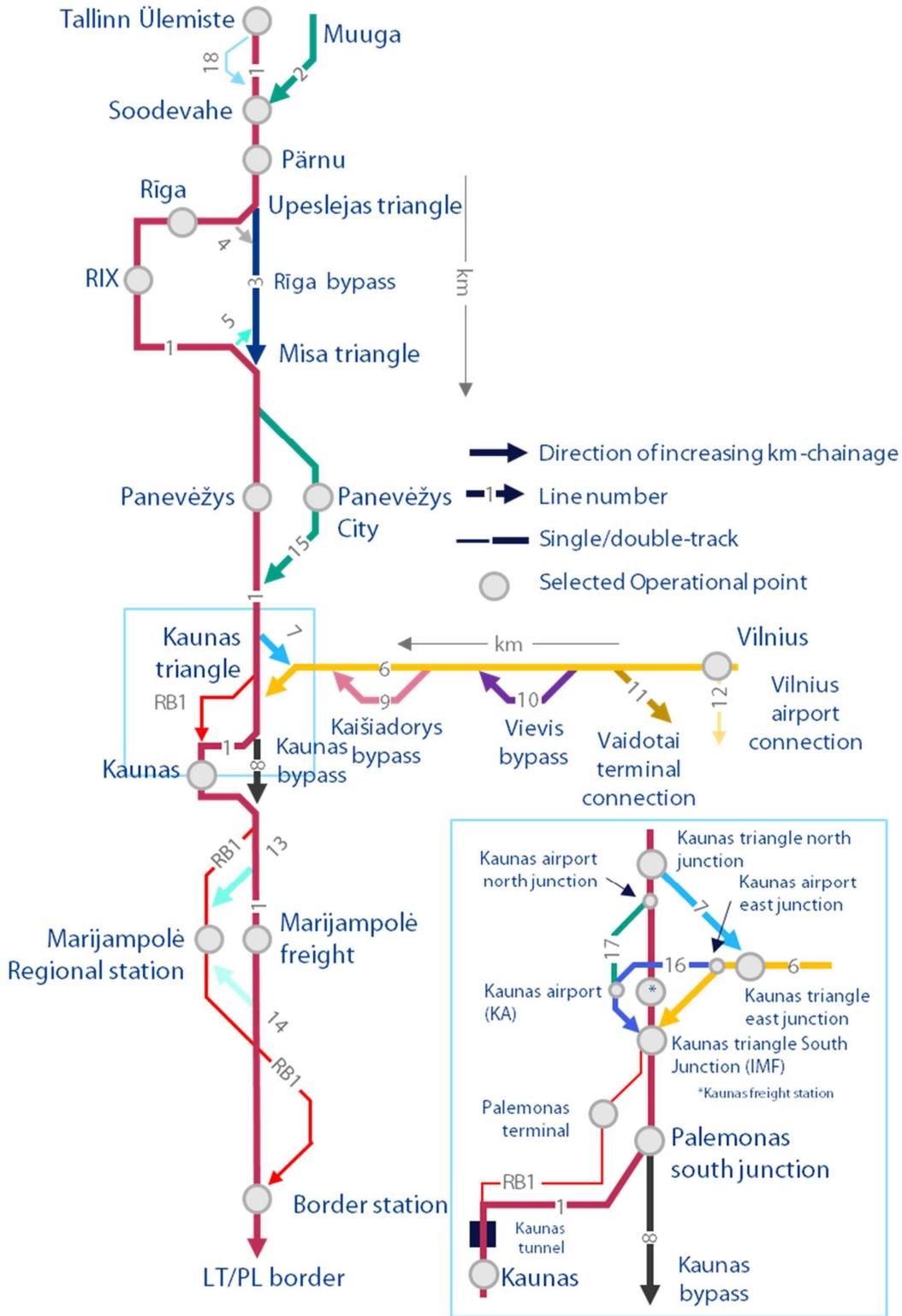


Figure 31: Schematic line numeration and direction of increasing km-chainage

71. Name and colour of the lines of Rail Baltica are shown in the table below:

*Table 8: Legend for the lines shown in the figure above*

No.	Line
01	<b>Main Corridor:</b> Tallinn Ülemiste – Rīga – Kaunas – LT/PL border
02	Tallinn Muuga – Soodevahe
03	<b>Rīga bypass:</b> Upeslejas triangle north junction – Salaspils – Misa triangle south junction
04	Upeslejas triangle west junction – Upeslejas triangle south junction
05	Misa triangle west junction – Misa triangle north junction
06	Vilnius – Kaunas triangle south junction
07	Kaunas triangle north junction – Kaunas triangle east junction
08	Palemonas south junction – Jiesia junction
09	Kaišiadorys bypass
10	Vievis bypass
11	Vaidotai terminal connection
12	Vilnius airport connection
13	Marijampolė North junction – Marijampolė regional station
14	Marijampolė South junction – Marijampolė regional station
15	Panevėžys city connection
16	Kaunas airport east junction – Kaunas airport
17	Kaunas airport north junction – Kaunas airport
18	Tallinn Ülemiste – Tallinn Ülemiste Depot
19	Mūsa (Bauska) station – Bauska city station
20	Bauska junction – Bauska Industrial Logistic Park
RB1	RB1: Palemonas terminal – Kaunas tunnel, Jiesia junction – Marijampolė – Mockava – Border station

## 8.1 Change of line and km-chainage

72. The change of line and/or change of the km-chainage usually happens in junctions where two lines meet or diverge (Misa triangle, Upeslejas triangle...) or inside of stations (for example Soodevahe station). More individual cases of how lines can meet/diverge exist. In this Guideline the applying cases are highlighted:

- a. Start of a diverging double track line from another double track line (see Figure 32).
- b. Joining of an ending double track line with another double track line (see Figure 33).
- c. Diverging of lines inside a station (see Figure 34)

73. For a beginning line diverging from the main line the rules for the km-chainage and the precise beginning of the new line are shown in the figure below.

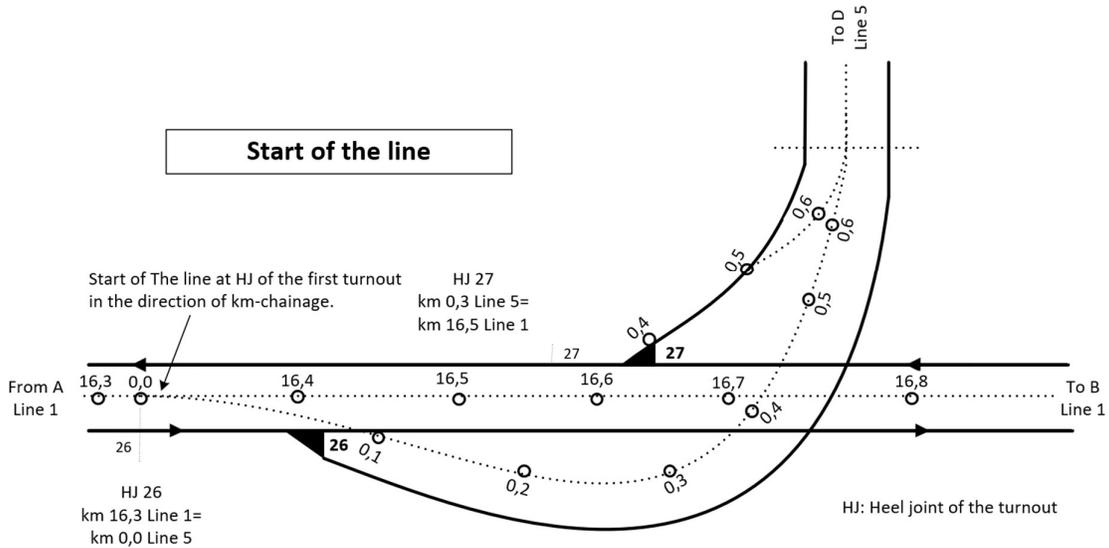


Figure 32: Change of Line km-chainage at the beginning of a diverging new line with growing km-chainage

74. For tow joining lines or the end of a separate line the rules for the km-chainage and the exact point of the end of the line are shown in the figure below.

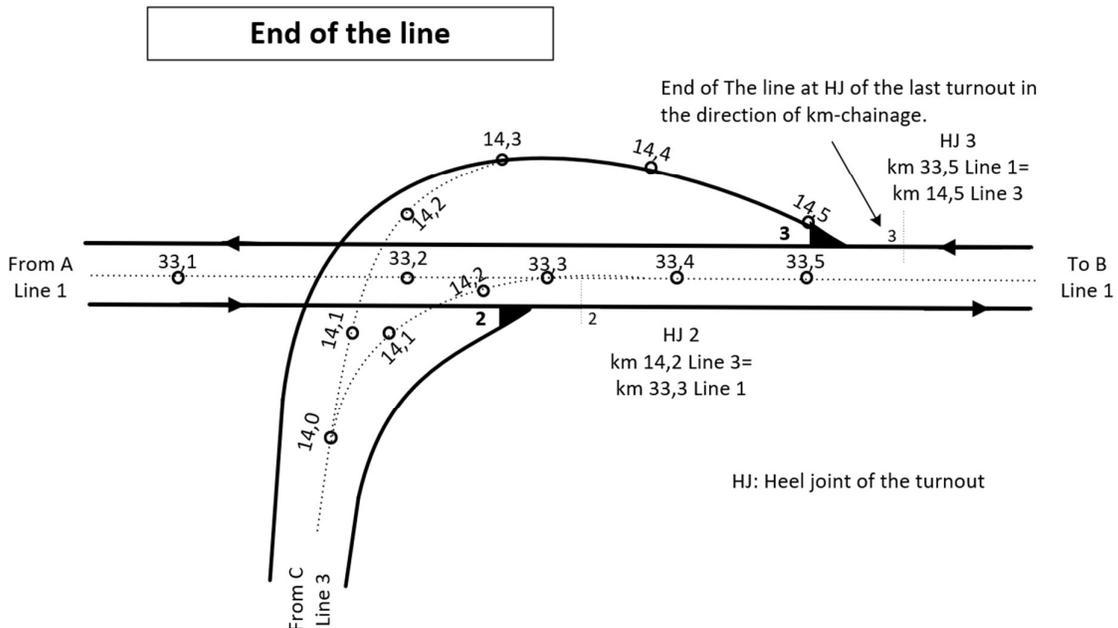


Figure 33: Change of Line km-chainage at the ending of the line joining another line with growing km-chainage

75. Lines can also change in the middle of the station. In this case the middle of the station (MOS) or fixpoint like the middle of the central station building or platform can be used to define the change of the line the km-point for the km-chainage handover.

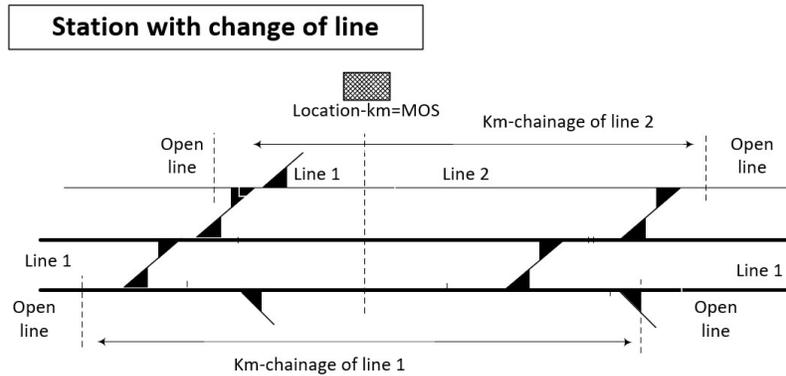


Figure 34: Line and km-chainage change inside stations

## 8.2 Numeration of main and branch line tracks

76. Main line tracks and branch line tracks shall be numbered with one-digit Arabic numerals. The main track in increasing km-direction (in general north to south and east to west) shall be numbered as track 1 and the track in opposite direction – for double track lines – as track 2, please refer to the Figure below.

*Line number and increasing km-direction and resulting track number for all lines please also refer to Figure 31 in the previous chapter. For exact definition of the numeration please refer to*

77. Table 9 below.

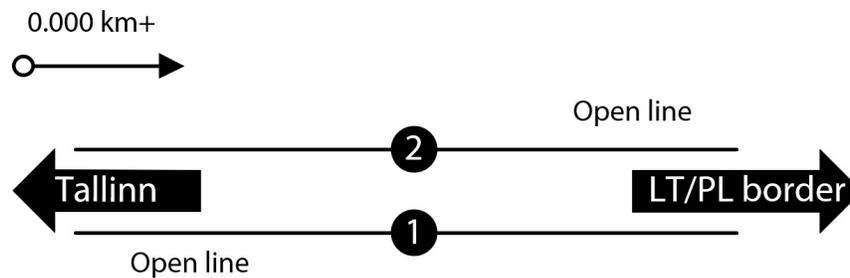


Figure 35: Numeration of tracks in the open line

Table 9: Numeration of main line tracks

Definition	Main line tracks
Numbering style	Arabic numbers
Format	N
Number of symbols	1 (one)

Main track number 1	The main track in km-direction
Main track number 2	The main track in opposite km-direction

## 9 Codification of elements in railway infrastructure facilities

78. In this document Infrastructure Facilities are to be understood as a summarizing definition for stations, crossovers, junctions. For Infrastructure maintenance facilities and rolling stock maintenance depots this guideline focuses on defining requirements for access and connection to these facilities. Precise layout and dimension to be agreed upon by design contractor and RBR.

### 9.1 Tracks in infrastructure facilities

79. This section refers to the definition of the alphanumeric numeration of the previously defined station elements (shown in Figure 36) like:

- a. Station through tracks (marked as 1 and 2)
- b. Side tracks (marked 3; 4; 5; 6 ...)
- c. Safety tracks (marked 14; 13; 24) and longer emergency and maintenance sidings (23; 25)

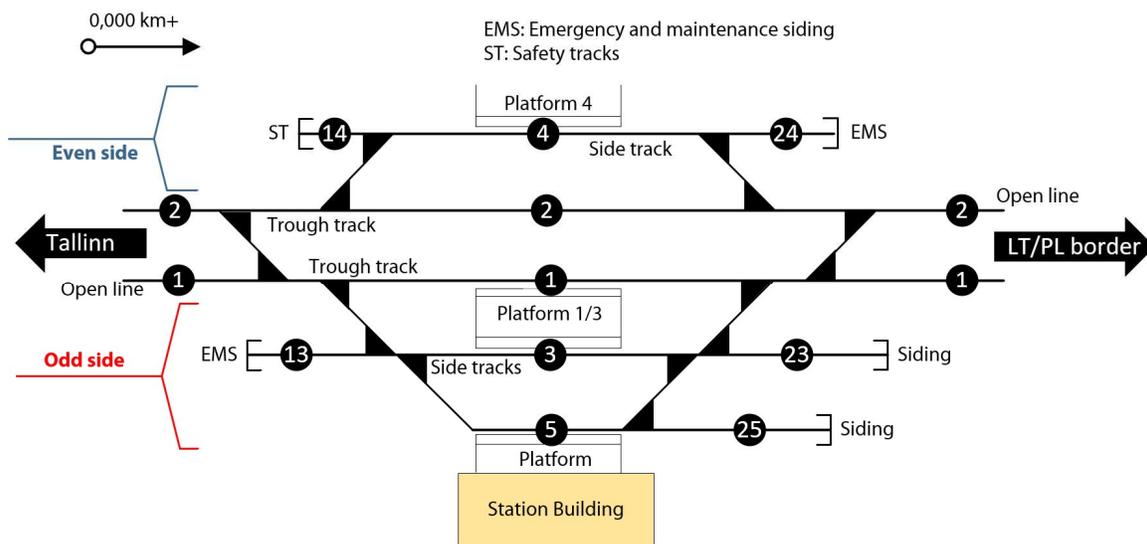


Figure 36: Numbering of tracks in infrastructure facilities

80. Tracks in stations shall be numbered with up to three-digit Arabic numerals, however zero in the beginning of the number shall not be spelled.

- a. **Station through tracks** (from/to open line) shall keep its “open line” numbers, i.e. 1 or 2.
  - b. **Side tracks** on the odd side of the station (side of the track 1) shall receive odd numbers, i.e. 3, 5, 7, etc. Side tracks on the even side of the station (side of the track 2) shall receive even numbers, i.e. 2, 4, 6, etc
  - c. **Emergency and maintenance sidings (EMS)** and **safety tracks (ST)** are separate tracks sections shall be numbered with up to three-digit Arabic numerals. The first digit shall describe location of the track in km-direction and increase with it, e.g. 1, 2, 3, 4, 5, etc. The last two digits describe the location of the track in relation to the station track, i.e. track section 14 and 14 of side track 4 behind the flank protection turnout (see Figure 36)
81. For **complex bigger stations** and **unique stations with both 1435 mm and 1520 mm gauge tracks**, the designer can propose the unique numbering of all tracks and platforms in order to avoid misinterpretation by passengers, operational and maintenance personnel. For this purpose, station tracks shall be preferably numbered starting from the main entrance of the station building, e.g. 1, 2, 3, 4, etc. If no main entrance or station building is available, tracks shall be numbered from right to left when looking in the km-direction.

*Table 10: Codification of station through tracks in infrastructure facilities*

<b>Numbering style</b>	Alphanumeric
<b>Format</b>	XXXNN XXX: 3 capital letters for OP code N: 01 Arabic number for through track number (first digit to be “0”) Through track nr. 01: in increasing km-direction (odd side) (zero in the beginning of the number is not spelled) Through track nr. 02: in opposite decreasing km-direction (even side) (zero in the beginning of the number is not spelled)
<b>Number of symbols</b>	5 (five)
<b>Example</b>	Skulte station (OP code STS), station through track in km-direction code to be STS01

*Table 11: Codification of side tracks in infrastructure facilities*

<b>Numbering style</b>	Alphanumeric
<b>Format</b>	XXXNN XXX: 3 capital letters for OP code NN: 2 Arabic numbers for side track number on the odd side of the station (side of the station through track 1) side tracks shall receive odd numbers, i.e. 03, 05, 07, etc. on the even side of the station (side of the station through track 2) side tracks shall receive even numbers, i.e. 04, 06, 08 etc.
<b>Number of symbols</b>	5 (five)

**Example** STS 03: Skulte station (OP code STS), side track 03 code to be STS03

Table 12: Codification of track sections like EMS and ST

<b>Numbering style</b>	Alphanumeric
<b>Format</b>	XXXNNN XXX: 3 capital letters for OP code NNN: 3 Arabic numbers for side track number N <sub>1</sub> : number of the track section of the side track, e.g. 1, 2, 3 N <sub>2</sub> N <sub>3</sub> : number of the side track like defined in Table 12
<b>Number of symbols</b>	6 (six)
<b>Example</b>	STS013 and STS023: Skulte station (OP code STS), side track 3, track section 13 and 23 behind the flank protection turnouts in Figure 36 above.

## 9.2 Turnouts in stations, junctions and crossovers

82. This section refers to the definition of the alphanumeric numeration of turnouts in stations, junctions and crossovers. In case of junctions forming larger triangles, special numeration rules apply.

83. **Turnouts in stations** (as shown in Figure 37 below), shall be numbered with three-digit Arabic numerals (zero in the beginning of the number is not spelled) and structured as follows:

- a. Odd numbers shall be assigned to elements in the station side with the lower chainage (e.g. 1, 3, 5, 7, etc) starting from the first turnout in km-chainage direction.
- b. Even numbers shall be assigned to elements in the station side with the higher chainage (e.g. 2, 4, 6, 8, etc) starting from the first turnout against km-chainage direction.

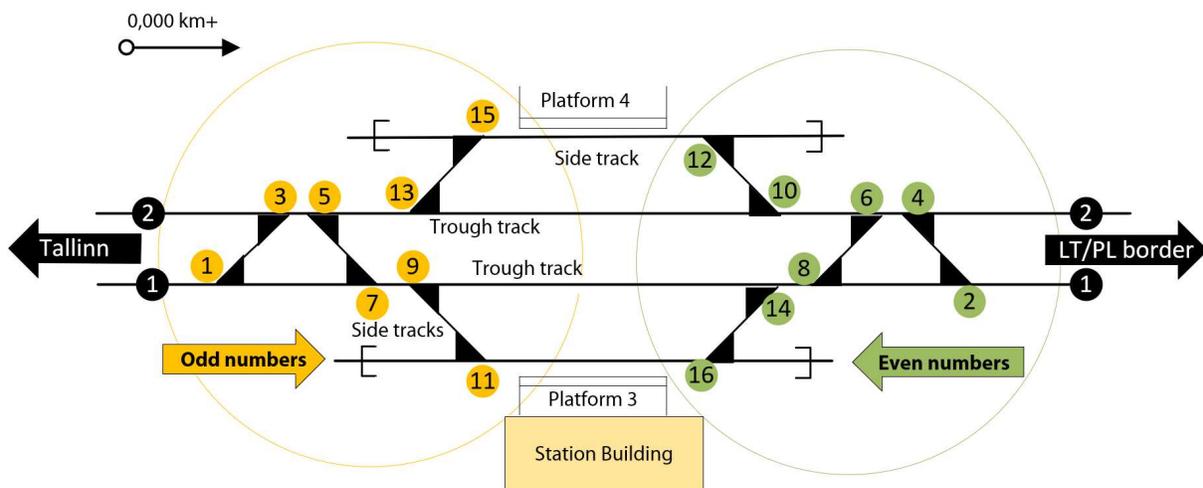


Figure 37: Numeration of turnouts in stations

84. **Turnouts in junction as part of larger triangles** (as shown in the Figure 38 below) the following rules shall apply:

- a. **Turnouts of the junctions on lower chainage** shall be assigned odd numbers (e.g. 1, 3, 5, 7...) starting from the first turnout in km-chainage direction.
- b. **Turnouts of the junctions on higher chainage** shall be assigned even numbers (e.g. 2, 4, 6, 8, etc) starting from the first turnout against km-chainage direction.
- c. **Turnouts located on the secondary line** shall be numbered starting from 20, numbering shall be based on km-direction. Odd numbers shall be assigned to turnouts with the lower chainage (e.g. 21, 23, etc) starting from the first turnout in km-chainage direction. Even numbers shall be assigned to turnouts with the higher chainage (e.g. 20, 22, 24, etc) starting from the first turnout against km-direction, as depicted in the figure below.

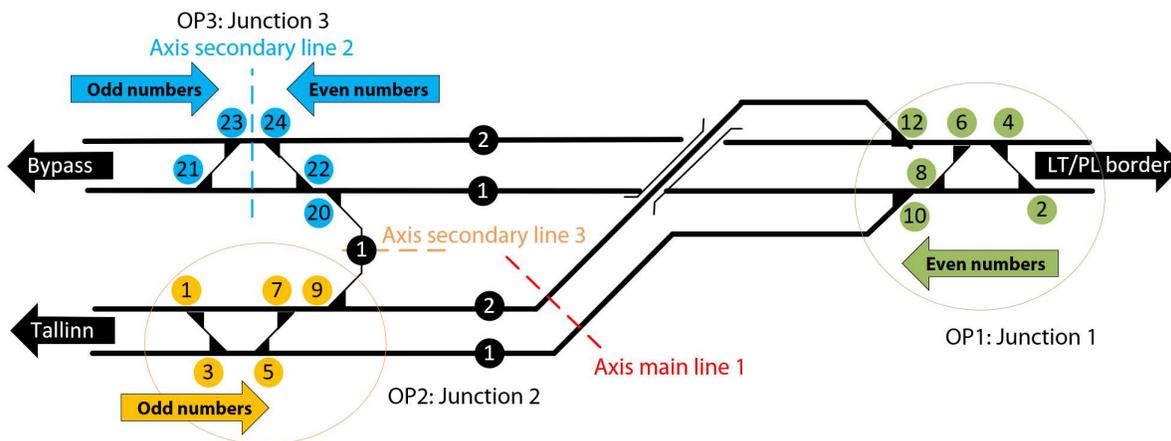


Figure 38: Numeration of turnouts in junctions of triangles

Table 13: Codification of turnouts in Operational points (stations, junctions, crossovers)

<b>Numbering style</b>	Alphanumeric
<b>Format</b>	XXXUNNN XXX: 3 capital letters for OP code U: 1 capital letter for the identification of the turnout NNN: 3 Arabic numbers for turnout number
<b>Number of symbols</b>	7 (seven)
<b>Example</b>	for Skulte station (Code STS), turnout 001 to have code STSU001

## 9.3 Platforms

85. This section refers to the definition of the alphanumeric numeration of the previously defined station elements (shown in Figure 39) like:

- a. **Platforms** shall receive the numbers which correspond to the tracks served from the respective platform. This shall ease communication between railway local personnel on the station and train personnel (train driver and on-board crews).
- b. **Side platforms** shall be numbered with four-digit numerals (second numerals part to be “00”) divided with the slash according to the number of the served track, e.g. Platform 04/00 serves track 04 (zero in the beginning of the number is not spelled).
- c. **Island platforms** shall be numbered with two sets of two-digit Arabic numerals divided with the slash, e.g. Platform 01/03 serves tracks 01 and 03 (zero in the beginning of the number is not spelled).

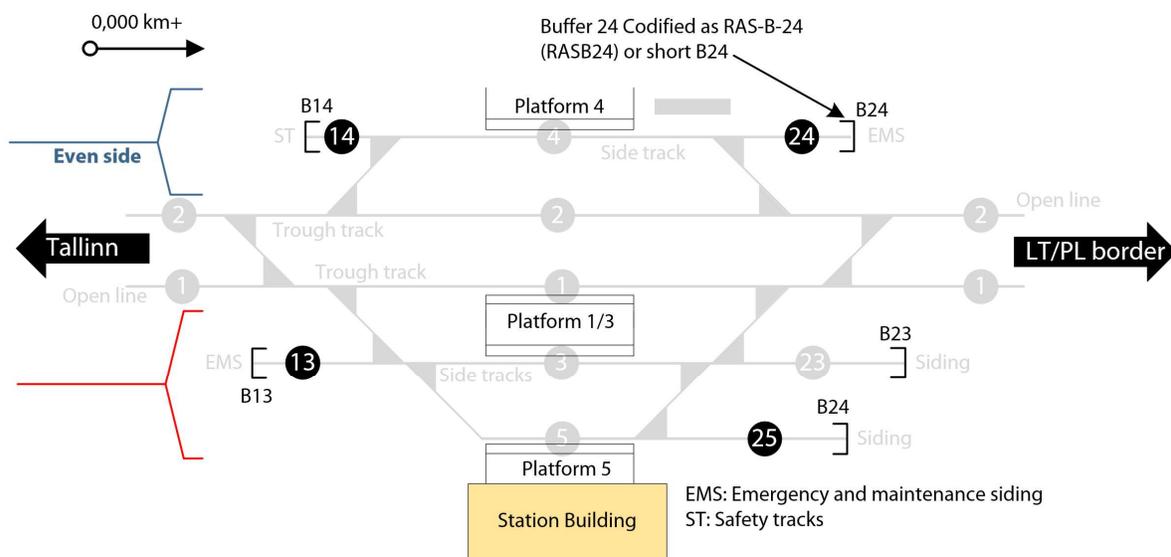


Figure 39: Buffer stops and platforms in stations

86. For stations with both 1435 mm and 1520 mm gauge tracks and platforms, the designer shall propose the unique numbering of all tracks and platforms in order to avoid misinterpretation by passengers, operational and maintenance personnel.

Table 14: Codification of platforms

<b>Numbering style</b>	Alphanumeric
<b>Format</b>	<p>XXXPNN/NN</p> <p>XXX: capital letters for OP code</p> <p>P: symbol – 1 capital letter as identification of the platform</p> <p>NN/NN: 4 Arabic numbers for platform number, divided with the slash (zero in the beginning of the number is not spelled)</p>
<b>Number of symbols</b>	9 (nine (with the slash))
<b>Example</b>	for Skulte station (Code STS), indication of platform 03/04 to have code STSP03/04.

## 9.4 Buffer stops

87. The buffer stops in dead-end track for example of safety tracks (ST) and emergency and maintenance sidings (EMS) will be codified as shown in the table below:

*Table 15: Codification of buffer stops*

<b>Numbering style</b>	Alphanumeric
<b>Format</b>	XXXBNNN XXX= OP code, B = indication of buffer stop, NNN = side track related to the buffer stop
<b>Number of symbols</b>	7 (seven)
<b>Example</b>	Skulte station (Code STS), buffer stop of side track 3 to have code STSB003

## 9.5 Rail expansion joints (REJ)

88. Numeration of Rail Expansion Joints (REJ) shall provide information on the location of the element.

89. The Rail Expansion Joints (REJ) will be codified by referring closest operational point (OP) and using number form the open line, station through tracks and side track to refer to the correct track inside the station or on the open line.

Table 16: Codification of rail expansion joints (REJ)

<b>Numbering style</b>	Alphanumeric
<b>Format</b>	<p>XXXXYYRZNN</p> <p>X<sub>1</sub>X<sub>2</sub>X<sub>3</sub> = OP code of the 1<sup>st</sup> operational point in increasing km-chainage direction, Y<sub>1</sub>Y<sub>2</sub>Y<sub>3</sub> = OP code of the 2<sup>nd</sup> operational point in increasing km-chainage direction</p> <p>If REJ in the same OP: X<sub>1</sub>X<sub>2</sub>X<sub>3</sub> = Y<sub>1</sub>Y<sub>2</sub>Y<sub>3</sub></p> <p>R = for Rail Expansion joint</p> <p>Z:</p> <ul style="list-style-type: none"> <li>a. for open line = 0</li> <li>b. for REJ in the OP: <ul style="list-style-type: none"> <li>i. 1 for the 1<sup>st</sup> REJ in increasing km-chainage direction</li> <li>ii. 2 for the 2<sup>nd</sup> REJ in increasing km-chainage direction</li> </ul> </li> </ul> <p>N<sub>4</sub>N<sub>5</sub> = REJ number identical to the track number as defined in Table 10</p>
<b>Number of symbols</b>	10 (ten)
<b>Example</b>	<p>The closest operational point (OP) in this case in northbound direction (decreasing km-chainage direction) is Soodevahe shunting yard (SOY) before Ulemiste (ULD) and on the open line track 1: ULDSOYR001</p> <p>For Daugavkrasti (DUH) REJ at track 1: DUH DUHR101 at track 1 at different chainage: DUH DUHR201</p>

## 9.6 Derailers

90. The derailleurs on sidings will be codified as shown in the table below:

Table 17: Codification of derailleurs

<b>Numbering style</b>	Alphanumeric
<b>Format</b>	<p>XXXDYNNN</p> <p>XXX= OP code, D = indication of derailer Y = number of derailer in the same track in increasing chainage NNN = side track related to the derailer</p>

<b>Number of symbols</b>	8 (eight)
<b>Example</b>	Panevėžys Cargo Terminal (Code PVF), 1 <sup>st</sup> derailer on side track 205 to have code PVFD1205

# 10 Infrastructure Phasing

91. **All infrastructure facilities** (tracks, turnouts, platforms, junctions, passing loops and associated civil works) shall be designed once for the **full-scope layout as defined for approved design in Full Scope RIS [4]**, independent of the construction phase in which they are implemented.
- If realised in Phases** – All infrastructure facilities shall be **upgrade-compatible**, enabling later expansion without changes to their original position, alignment, or functional concept.
  - Embankments, cuttings, bridges, and earthworks** shall be **dimensioned for the final number of tracks**, even if only a reduced configuration is initially constructed.
  - Temporary infrastructure solutions** that would require later dismantling or reconstruction shall be avoided.
  - Early-phase infrastructure shall not constrain later operational concepts, capacity upgrades, or system extensions. Design requirements like flank protection also apply for Phasing (see chapter 4.3).
  - Phasing shall be limited to **construction and commissioning**, while geometric position, dimensions, and interfaces of infrastructure elements shall remain unchanged throughout all phases.
92. Track alignment, spacing, turnout geometry, platform length, and clearances shall reflect the **ultimate operational requirements** – defined in the Operational concept [5] – from the first Phase onwards to full scope.

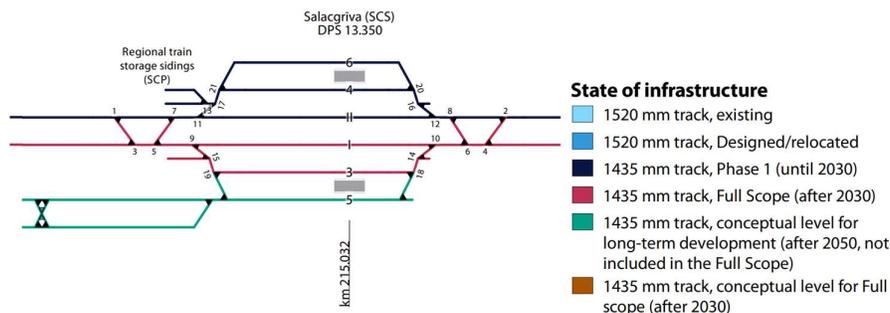


Figure 40: Railway Infrastructure Schematic for Phase 1 (Excerpt)

93. Interfaces between civil works and railway systems shall be clearly defined and preserved throughout all phases.
- Energy (ENE) and Command & Control / Signalling (CCS) systems shall be fully considered from the first phase.

- b. Drainage, fencing, access roads, maintenance paths, and safety installations shall be designed to support the **full-scope infrastructure**.
  - c. Space reservations for substations, technical rooms, foundations, cable routes, ducts, and installation clearances shall be foreseen from the first Phase, such that later ENE and CCS deployment does not require civil rework.
94. **Infrastructure documentation shall remain consistent across all phases** to avoid redesign of ENE and CCS systems for later stages. This way phasing shall minimise lifecycle costs by avoiding duplicated design, construction, and commissioning activities.
95. The **phasing strategy shall support continuous railway operation** during future upgrades wherever feasible.

## Process control

96. Document Creation: The Operation and Maintenance Team is responsible for creating and updating the document.
97. Document Review and Approval: The final version of the document to be approved as per RBR procedures.
98. Document Revision: For documents revisions the Guide RBGL-DMT-QRG-Z-00003 (Revision and Version Management) to be followed. Revisions to be registered in the “Document History”.
99. Document Publishing: this document is for internal use.
100. Document Obsoleting: When new revision is published, previous version became obsolete.

## Review and update of the Document

The document will be reviewed and revised whenever it is deemed necessary.

## References

Ref:	Document Number:	Document Title:	Link
Internal Governance Documents			
1.	RBDG-DWG-010-A4	RBDG-DWG-010-A4	<a href="#">Design Guidelines   Rail Baltica</a>
2.	RBDG-MAN-026	Stations and Passenger platforms	<a href="#">Link</a>
3.		OP List	
4.	RBDN-SOD-ZZ-ZZ- DRW-R-00001	Railway Infrastructure Schematic for full scope track design	

5.	RBP002-RBR-ZZ-ZZ- REP-R4-00001	Operational Concept Report	
Quick Reference Guide			
3.	V 1.6.1	Guide on the application of the common specifications of the register of Infrastructure	<a href="#">RINF Application guide V1.6.1.pdf (europa.eu)</a>
4.	RBDN-SEA-PPS-R- 00001	Regional stations when HS train passing by while passengers standing on platforms	<a href="#">Link</a> to S&O SharePoint
5.	P0023865-1-H12 Rev. 2	RINA safety study, risk assessment for passenger platforms	<a href="#">Link to RINA study</a> on S&O SharePoint
6	OP 18-11-15	Operational plan (including annexes)	<a href="#">Link</a>
7	TSI INF	in chapter 4.2.9.3 for GC gauge and in chapter 7.7.16.2 for the Sect gauge, chapter 4.2.9.2. for platform height offset	