

Regulation

of ...

on the construction and approval of railway installations (Railway Construction Regulation [Eisenbahn-Bauverordnung – EBV])

The Government is enacting the following on the basis of Article 9 Paragraph 2 Letter a), Article 10 Paragraph 9, Article 43 Paragraph 1 and Article 62 Paragraph 1 Letters a), b) and l) of the Railway Act (Eisenbahngesetz – EBG) of 16 March 2011, Federal State Law Gazette 2011 No 182, as amended:

I. General provisions

Article 1

Subject and purpose

- 1) This Regulation governs:
 - a) construction measures requiring notification;
 - b) the issuance of railway-related building permits;
 - c) construction plans for the construction or modification of railway infrastructure installations, other related railway installations and connecting railways;
- 2) The provisions for new constructions also apply to significant conversions.
- 3) The provisions for new constructions must be followed during repair, as long as the changes caused do not result in disproportionately high costs.
- 4) The provisions of this Regulation shall apply unless non-binding Technical Specifications for Interoperability (TSI) pursuant to Article 10 Paragraph 2 of the Railway Act determine otherwise.
- 5) ‘Safety and order’ in the sense of this Regulation refers to the ‘safety and order of railway operation, railway vehicle operation on the railway and transportation on railways’.

6) References to persons, occupations and positions made in this Regulation refer to both males and females.

7) If this Regulation makes reference to EEA legislation, then said references shall apply to the respective version currently in effect.

Article 2

General requirements

The railway infrastructure must be rendered so as to meet the requirements for safety and order. These requirements are deemed to have been met if the installations comply with the provisions of this Regulation and the generally acknowledged rules of technology.

2) The generally acknowledged rules of technology may be deviated from if safety and order can be guaranteed by other means.

Article 3

Exceptions

The railway authority may approve measures other than those specified in this Regulation on a case-by-case basis if the railway company demonstrates that safety and order can be guaranteed by other means.

II. Railway infrastructure

Article 4

Terms and definitions

1) The following terms and definitions shall be used in this Regulation:

- a) 'Railway stations': Operating installations with at least one track switch where train trips can begin, end or be diverted or switched. The entry signals or trapeze posts, or otherwise the arrival points, are generally considered to be the boundary between railway stations and the open line. In Section II of this Regulation, the arrival point is considered to be the boundary between the railway stations and the open line;
- b) 'Block sections': Sections of track which a train may only arrive at if said sections are free of railway vehicles;
- c) 'Block posts': Operating installations which delimit a block section;

- d) 'Junctions': block posts on the open line where train trips can be switched from one track to another;
- e) 'Crossovers': block posts on the open line where train trips can be switched from one track on the same line to another;
- f) 'Connection points': operating installations on the free line where trips can be shunted onto a connected track without the block section being approved for a different train trip;
- g) 'Passenger stations': Operating installations without track switches where train trips can stop, begin or end according to schedule;
- h) 'Main tracks': tracks which are equipped with safety technology for train trips, such as the main tracks on the open line and their continuations into the railway stations.

Article 5

Track gauge

1) The track gauge is the smallest spacing of the railheads' inside surfaces in the range from 0 to 14 mm below the top of the rail.

2) The basic track gauge size amounts to 1,435 mm and may not exceed 1,465 mm.

3) The track gauge may not be lower than the following values in arcs with radii of under 175 m:

- a) arc radii under 175 to 150 – track gauge 1,435 mm;
- b) arc radii under 150 to 125 – track gauge 1,440 mm and
- c) arc radii under 125 to 100 – track gauge 1,445 mm.

Article 6

Design elements on curved track plan

1) The layout must be as elongated as possible for new constructions. The number of line routing elements should be kept as small as possible in the process. The line routing elements straight, circular arc and transition curve shall be used in the plan.

2) The arc radius in continuous main tracks may not be less than 300 m for new constructions.

3) The direction of continuous main tracks may generally only change steadily. Transition curves shall be created where necessary.

4) The outer rails must generally be higher than the inner ones in the curves of continuous main tracks (cant). The cant must be determined depending on the design of the superstructure, the construction type of the railway vehicle and the loading and securing thereof. The cant may not exceed 180 mm including the deviations which are set during operation.

5) Any change to the cant must be determined using a superelevation ramp with an inclination not exceeding 1:400.

Article 7

Longitudinal inclination

1) The longitudinal inclination for new constructions must be selected so as to be as small as possible. In the process, the number of changes in inclination must be kept as small as possible.

2) The longitudinal inclination of tracks may not exceed 12.5 per thousand for new constructions.

3) The longitudinal inclination of track sections which are intended for parking railway vehicles may not exceed 2.5 per thousand for new constructions.

4) Changes in inclination on main tracks must be rounded out.

Article 8

Load-bearing capacity of superstructures and structures

The superstructure and structures must be able to accommodate railway vehicles with the respective approved axle load and the respective approved metre load at the approved speed; however, they must at least be able to accommodate railway vehicles with an axle load of 20 t and a metre load of 6.4 t/m.

Article 9

Standard clearance gauge

The standard clearance gauge is the space which must be kept free for each track. The standard clearance gauge is made up of the space required for unhindered railway vehicle passage and additional spaces for structural and operational purposes.

Article 10
Track spacing

1) The track spacing is the distance from the centre to the centre of adjacent tracks.

2) On the free line, the track spacing must be dimensioned for new constructions in accordance with the standard clearance gauge to be used according to the acknowledged rules of technology and must amount to at least 3.80 m for new constructions on the free line. Existing track spacings of 3.80 m and less may not be reduced.

Article 11
Level railway crossings

1) Crossings which are only used for internal service traffic and level platform accesses are not deemed to be level railway crossings.

2) Level railway crossings as well as crossings which are only used for internal service traffic and level platform accesses are not permitted on lines with an approved speed of over 160 km/h.

Article 12
Level crossings of track railways

New level crossings of track railways may not be established outside of railway stations or main signals of junctions.

Article 13
Platforms, ramps

1) For new platform constructions, the platform edges must generally be laid at an elevation of 0.55 m above the top of the rail; heights of under 0.38 m and over 0.76 m are not permitted. Attention must be paid to the cant for curved tracks.

2) Fixed objects on platforms (columns and similar) must be at least 3.00 m away from the centre of the track up to a height of 3.05 m above the top of the rail. This value may be reduced from 3.00 m to 2.70 m for existing installations with light traffic.

3) The areas to be kept free during the passage of railway vehicles must be marked on platforms with paved surfaces, if the width allows.

4) The areas to be kept free during the passage of railway vehicles must be coloured red on platforms on tracks which are travelled on at speeds exceeding 160 km/h. At speeds exceeding 200 km/h, measures must be taken to ensure that railway users do not linger in the danger zone on the platforms.

5) Care must be taken to ensure the protection of railway users who must cross level platform accesses.

6) Side ramps on which cargo cars with doors which open outward are loaded and unloaded may not be higher than 1.10 m above the top of the rail. The height may not exceed 1.00 m if entry doors of passenger train cars which open outward must be opened there. Other side ramps for loading or unloading cars may be up to 1.20 m above the top of the rail (except on main tracks).

Article 14

Signals and track switches

1) The signals on the track system are equivalent to corresponding displays in the driver's cabin; said displays may replace signals on the track system.

2) The access points to railway stations must be secured with main signals.

3) The exit points from railway stations must be secured with main signals (exit signals).

4) The basic position for main signals is the 'Stop' position; other positions are permissible for main signals on track sections with automatic line blocking or for main signals at facilities which are not involved in the arrangement of train order for long periods of time or at regularly recurrent intervals.

5) Block posts, junctions and crossovers must be secured by main signals.

5) Level railway crossings must be secured by main signals in mutual interdependence.

7) Track switches on the main line and track crossings associated with them must be secured by signals. Track crossings of connection points may also be secured by signals of neighbouring train

sequencing points if there is an interdependency between connection track switches, flank protection devices and signals.

8) Track switches must be dependent on the signals which apply to train travel in such a manner that the signals can only be placed in the release position if the track switches are technically retained in the correct position for the track system (signal interdependency). The technical retention of remote controlled track switches must be maintained until it is released.

9) If there is no signal interdependency of track switches which trains pass over against the head of the train, then said track switches must be technically secured or monitored.

10) Flank protection measures must be taken for train trips. For tracks which are travelled on at over 160 km/h, flank protection must be ensured using safety switches or stop blocks at railway stations and on connection points.

11) The entry signals and main signals on the open line must be connected to approach signals. The term displayed on the approach signal must correspond with the term on the associated main signal. If this is not possible, the term which ensures the greatest degree of safety possible must be displayed.

12) The distance between the main signal and the associated approach signal must be as least as great as the length of the braking distance.

13) For track switches which are not connected to an electronic or electrical signal box, a basic position must be determined if trains travelling over said track switches could endanger trains travelling on the main tracks.

14) Track switches must be equipped with track switch signals. Track signals on shunting routes are exempt from this, if said track signals cannot be released for local control.

15) A boundary marker which indicates the point up to which one track can be occupied without endangering railway vehicles on the adjacent track must be present between tracks which run together.

Article 15

Technical safeguarding of train sequence, automatic train control

- 1) Following and opposing train trips in the same block section must be precluded by means of technical safeguarding.
- 2) Lines which are approved for train travel at up to 160 km/h must be equipped with automatic train control which can be used to bring a train to a halt automatically.
- 3) Lines which are approved for train travel at over 160 km/h must be equipped with automatic train control which can be used to bring a train to a halt as well as drive it automatically.
- 4) In the event of a malfunction, trains may travel with a maximum speed of not more than 80 km/h on lines which are equipped with automatic train control.

Article 16

Telecommunication systems

- 1) Train sequencing points and train movement reporting points must be connected by telecommunication systems. Level crossing huts and lineside telephones must be activated in the connection.
- 2) Telephone train reports and train movement reports must be recorded via voice memory storage.
- 3) Lines must be equipped with train radio devices.
- 4) Platforms on tracks which are travelled on at over 160 km/h must be equipped with a loudspeaker system and automatic warning message as well as visual display equipment.

Article 17

Recurrent inspections of operating installations – Monitoring of hazardous points

- 1) The operating installations must be recurrently inspected according to schedule to ensure that they are configured properly. The type, extent and frequency of the recurrent inspection must be based on the operating installations' condition and loading as well as on the approved speed. Records must be kept on the recurrent inspections of the operating installations.
- 2) Hazardous points must be monitored so that operational hazards can be identified and remedial measures taken in a timely manner.

III. Construction plan

Article 18

General requirements

1) All documents of a construction plan must be executed, competently composed and coordinated for one another according to the rules of technical drafting.

2) The construction plan must describe the circumstances which are decisive for evaluating the construction project. If detail definitions according to the acknowledged rules of technology are first made in the course of a subsequent planning stage or during construction, the criteria which the detail definitions are based on and the measures which must be taken in order to meet said criteria must be described.

3) If individual specifications prescribed in accordance with this Regulation are not relevant to a construction project or if the building permit applicant cannot reasonably be expected to present them in light of the state of knowledge and testing methods, then they may be dispensed with. In the later case, this must be noted and justified in the documents.

4) If the construction project cannot be evaluated based on the documents prescribed by this Regulation alone, then further documentation (such as plans, calculations, test certificates, models or diagrams) must be provided.

5) The description standards established in this Regulation may be deviated from if doing so does not impair the comprehensibility. A scale of depiction established in this Regulation may be deviated from on a case-by-case basis if said scale prevents or complicates the evaluation.

6) The kilometrage must be made precisely to the third decimal place.

7) If construction measures on installations which are not part of the railway infrastructure are related to a construction project requiring approval, then only the specifications required to evaluate the measures which require approval must be recorded in the construction plan documents which are enclosed with an application for the issuance of a railway-related building permit.

Article 19

Procedural requirements

1) Documents must contain the following:

- a) the name of the railway company and name of the person responsible for approving the document;
- b) the name of the company commissioned with the planning, if different from the railway company, and the name of the person responsible for the contents of the document;
- c) the designation of the construction project;
- d) contents of the document, including the scale in the case of plans;
- e) serial and version number;
- f) date of completion;
- g) plan substitute notes, if any.

2) The version number must be adjusted before approving and incorporating modified documents into the construction plan.

3) The designation of the construction project must describe the construction project in terms of the measures conducted and the location. It should specify the railway line or railway installation by stating the starting point and end point of the line, the kilometric or otherwise clearly defined geographic location as well as the brief designation of the construction measure.

4) The railway company must keep the documents until the railway infrastructure installations have been taken out of operation. The railway company may archive documents in electronic form, as long as steps are taken to ensure that:

- a) all changes in comparison with approved document versions are documented and outdated versions are retained;
- b) the documents can be printed out in paper form at any time.

Article 20

Documents

1) The construction plan consists of the following documents:

- a) table of contents;
- b) report;

- c) overview;
- d) site plan;
- e) the specifications and documents according to the acknowledged rules of technology required for all railway infrastructure installations to be executed (i.e. longitudinal sections, cross sections, layouts, schematic depictions);
- f) basic specifications on the transportation routes and waterways to be restored by the railway company and the enclosures and protective structures to be constructed.

2) If properties and rights of third parties must be used in order to realise the construction project, then the list of the third parties affected and the land acquisition documents must also be submitted.

3) The documents pursuant to Paragraph 1 Letters a) through c) must also be submitted in an electronically readable form.

Article 21

Table of contents

1) The table of contents must specify the serial and version number, date of completion, contents and scale of depiction for each part of the construction plan.

2) In addition, a space with dimensions of at least 160 x 40 mm for official notes as well as space for the name and signature of the company conducting the construction must be kept free on the first page of the table of contents.

3) If construction plan documents are replaced or supplemented during the ongoing process, the table of contents must also be replaced or the change must be noted in it in writing, along with an indication of the responsible person from the railway company.

Article 22

Report

1) The report must describe the construction project and contain at least all of the specifications required to evaluate the construction project which are not evident from the plans.

2) If multiple partial reports relating to individual construction measures or particular aspects of the construction project are attached to the construction plan due to the size of the construction project, the summary report must make reference to the respective partial reports.

3) The report must contain the following in particular:

1. a generally comprehensible brief description of the planned construction measures, including their objectives and significant effects on the environment;

2. a description of the underlying design parameters and project bases, including the following:

a) safety requirements;

b) determination of the railway security installations, including block signalling devices and automatic train control systems;

c) justification for deviations from the acknowledged rules of technology;

3. the size of the area used, in which construction site set-up areas which are additionally required must be indicated separately;

4. description of the surroundings affected by the construction project and the type of effects, including:

a) list of the waterways, traffic infrastructure and areas worthy of protection which are affected by the construction project;

b) measures to protect the surrounding area during the construction and operation phase;

c) measures to restore the surrounding area disrupted by the construction;

d) evidence preservation programme during the construction and operation phase;

5. construction description, description of the construction execution and operating phase

a) description of the existing situation;

b) changes in comparison with the existing situation;

c) requirements on the construction products, components, component assemblies and installations to be used;

d) the planned commencement and required duration of the construction execution as well as the estimated number of persons employed;

e) specifications on the illumination, heating and ventilation of the rooms and other parts of the structures;

f) provisional construction arrangements and construction stages which serve to maintain the operation of the railway, railway vehicles on the railway or transit on the railway;

- g) specifications on barrier-free design;
 - h) determination of the general conditions which are decisive for operation;
 - i) description of the construction project's effects on operation (operating programme), including the number of employees to be deployed as well as the work operations and work procedures;
 - j) specifications on the technical equipment, tools and work materials to be used, as well as the type and number of any potential storage facilities;
 - k) description of the measures to prevent and handle extraordinary events (such as a security and evacuation concept, emergency travel programme);
 - l) the type of connection with public thoroughfares, water supply as well as wastewater and waste disposal;
 - m) phases during the commissioning process.
- 4) If the construction project affects interests which the Federal State or the Municipalities are responsible for, or affects subjective public rights of third parties, then the following specifications must also be provided:
1. a description of the benefits to the public of realising the construction project;
 2. general conditions for route determination.

Article 23

Plans

- 1) The colours used in the plans must be explained in a legend.
- 2) The direction north must be marked in each site plan.
- 3) Tracks, track switches, crossings and the significant signals (at least the main signals, safety signals and approach signals) must be clearly labelled and the kilometrage must be determined. The directional orientation of railway lines must be established by specifying the neighbouring railway stations.
- 4) Depictions of installations and objects which are not part of the actual construction project (such as trees, vehicles, etc.) must be kept in such a manner that they do not impair the informative value of the plans. The plans may only depict plantings which are planned, as well as already existing plantings which must be retained.
- 5) Views must include:
 1. a clear visibility reference value;

2. the exterior views of the construction project, including views of the previous status of the structures in the case of expansions and conversions;

3. the depiction of the project, the course of the adjoining terrain before and after construction execution (as well as the course of the projected adjoining terrain, in the case of intended changes) and the adjoining physical structures.

6) The following must be depicted in site plans and layouts:

1. red: buildings and installations as well as components to be constructed as new;

2. grey: already existing buildings and installations as well as components to be retained;

3. yellow: buildings and installations as well as components to be removed;

4. brown: boundaries of railway land;

5. red-yellow shaded: structures and components to be removed and constructed as new at the same location.

Article 24

Overview

1) The main outlines of the construction project as a whole must be depicted in a generally understandable and easily comprehensible form on an overview map on a size of 210 mm x 297 mm, or a size of 420 mm x 297 mm for large-scale construction projects.

2) The location of the main structures, including traffic facilities and waterways must be depicted in a clear form on an overview plan on a scale of 1:5000 to 1:2000.

3) If the site plan does not exceed the dimensions of 594 mm x 841 mm, then it will not be necessary to submit the overview map and overview plan. It will suffice to submit the overview map, if it also meets the requirements of Paragraph 2.

Article 25

Site plan

1) Site plans must be made on a scale of 1:500 or 1:1000, while rail division plans must be made on a scale of 1:200. The following must be plotted and labelled in particular:

1. regarding properties which the construction itself makes use of which are located in a construction prohibition zone, as well as those which must be subjected to changes or restrictions due to their location in a hazard zone,

a) the property boundaries,

b) the boundaries of railway land,

c) existing and altered railway station boundaries,

d) the existing and altered construction prohibition zones and hazard zones, and thus any areas which must be subjected to changes or restrictions due to their location in said zones as a result of the project,

e) the numbers of the properties, including specifications of the real estate number and municipality; in the case of roads, their name must be specified in addition to the property number, and

f) existing structures including traffic facilities, waterways, canals, pipelines, high voltage systems and telecommunications systems (overhead lines, aerial and underground cables),

2. the main dimensions, kilometric position of the railway infrastructure installations, other installations and supply facilities associated with the project as well as their distances to existing structures and railway land boundaries;

3. public, non-public and railway-internal route connections, accesses and control rooms and shelters, as well as escape routes, each with their width and designation, as well as the connection to them,

4. boundaries of defined areas (such as other railways, railway station area, power supply sections);

5. the arrangement and dimensions of green areas.

2) If the location of railway infrastructure installations and other installations which are associated with the construction measure must first be determined at a later time according to the acknowledged rules of technology, then those areas in which the installations may be situated must be marked.

3) If the necessary contents of a site plan are distributed throughout multiple plans, then the specifications must be divided on the plans in such a manner that it is possible to find the specifications for a specialised technical field required for the evaluation on only one partial plan.

Article 26

Longitudinal sections

1) Longitudinal section must be arranged in longitudinal and elevation scales 1:2000/200 or 1:1000/100. They must contain the kilometrage, curvature and cant string as well as the inclination string.

2) The track and transition curves along with a specification of their radius as well as the kilometre specification of their main routing points as well as the track extensions shall be specified in the curvature string, while the cants, ramp lengths and ramp slopes shall be specified in the cant

string. The terrain line and all of the track switches and track crossings on the rack, as well as all crossings with traffic facilities, waterways, canals, pipelines and overhead lines shall be recorded, along with specifications of their main dimensions and elevations.

3) All track inclinations and changes of inclination shall be entered in the inclination string, along with the associated specifications (vertical curve radius, tangent length, ordinates at the intersection of the vertical curve tangents). A short radius arrow at the beginning and end point of the vertical curve (including the kilometre specification of said points) shall be used to determine whether the centre of the vertical curve comes to rest above or below the top of the rail.

Article 27

Railway line cross sections

1) The cross sections must be specified. The clearance as well as distances from structures in the vicinity must be plotted. If there are bottlenecks in the area of a curved track, then the radius of said curved track must be specified. Enlargement caused by curve additions and additions from cants shall be specified and depicted. Cross sections shall be made on a scale of 1:100 or 1:200.

2) A characteristic cross section must indicate the dimensions of the ballast profile including the shoulders, control rooms and measures for draining the ballast bed, as well as the clearance to be considered.

3) The cross sections which are decisive in evaluating the construction project must be established (for such cases as clearance restrictions, level railway crossings, tracks in paved areas, gate openings of enclosures and factory hall entrances). The cross sections must be numbered consecutively accordance to the kilometrage. The kilometre specification must be included.

Article 28

Layout

1) Layouts must indicate the following:

1. size and position of rooms and other building parts as well as the useable areas thereof;
2. purpose of use of rooms and other building parts as well as the illumination thereof;
3. exits, traffic and escape routes;
4. location of the technical equipment to be installed.

2) Layouts shall be made on a scale of 1:100 or 1:200.

Article 29

List of third parties affected

1) The list of third parties affected must specify the Federal State and municipal authorities who are responsible for interests which are affected by the construction project, as well as the parties known, including the points of transfer.

2) The number of persons who are endangered or inconvenienced by the construction, operation or existence of the construction measure, or whose domestic or foreign property rights may be jeopardised, must also be specified. If the specification can only be provided on the basis of an estimate, then it must be justified.

Article 30

Land acquisition documents

1) The land acquisition documents, which must be composed separately according to municipality, consists of the land acquisition plans and the lists of properties and rights which are used.

2) Land acquisition documents must be made on the scale of official measurement.

Article 31

Construction projects requiring notification

The following require notification, although a railway-related building permit pursuant to Article 9 Paragraph 2 of the Railway Act is not required:

1. for the construction and modification of the railway infrastructure, as long as it does not require extensive work;
2. for the construction and modification of a railway's installations which are not part of the railway infrastructure;
3. for the commissioning of modified railway vehicles, as long as the modification does not require extensive work.

Article 32

Extensive work

1) The construction and modification of a railway's installations require extensive work in the sense of Article 31 of the Railway Construction Regulation if the overall project:

1. constructs a line or part of a line as new or if a part of a line of at least 3 km is restored or converted;
2. involves the new construction, expansion or restoration of one of the following installations:
 - a) bridges with a bridge structure area of over 400 m²;
 - b) basin or tunnel structures with a length of over 250 m;
 - c) abutments, walls, dams or trenches with a height of over ten metres;
 - d) refilling facilities with a tank volume of over 80 m³;
 - e) building with over 150 m² of built-up area or more than two full storeys;
 - f) roofs and enclosures with an area of over 2,000 m²;
3. constructs new installations and parts of installations for generating energy for the railway in power plants, convertor or inverter facilities (such as generators, convertors, transformers) or transmission lines (such as overhead lines, power rails, cables, supporting structures) or increases the output (rated energy capacity) thereof by over 25 per cent;
4. constructions new high-voltage installations (in relation to a supply section or substation) or increases the output thereof by over 25 per cent. Work which is not extensive requires increases in output for aerial line sections of under 5 km, coupling points and switching posts;
5. expands the electronic or electrical signal box of the railway safety system by more than 30 per cent of the electrically integrated track switches;
6. affects central functions (i.e. in the ATC computer, in the ETCS radio block centre) of the continuous train control;
7. results in an additional incorporation of an electronic or electrical signal box into remote control centre;
8. alters railway crossing safety equipment.

Article 33

Recording duties

The railway company must keep records on the execution of projects which do not require approval pursuant to Article 9 Paragraph 2 of the Railway Act; said record must also indicate the

fulfilment of the requirements for construction projects not requiring approval. The records must be enclosed with the documents which are relevant to construction and repair.

Article 34

Entry into legal effect

This Regulation shall enter into legal effect on the day of its promulgation.