

	<p style="text-align: center;">TECHNICAL STANDARDS          DETAILED TECHNICAL CONDITIONS FOR THE          CONSTRUCTION OF THE RAILWAY INFRA-          STRUCTURE OF THE SOLIDARITY TRANSPORT          HUB          – DESIGN GUIDELINES</p>	<p style="text-align: center;">CENTRALNY PORT KOMUNIKACYJNY          –          SOLIDARITY TRANSPORT HUB          POLAND</p>
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**TECHNICAL STANDARDS**

**DETAILED TECHNICAL CONDITIONS FOR THE CON-  
 STRUCTION OF THE RAILWAY INFRASTRUCTURE OF  
 THE SOLIDARITY TRANSPORT HUB – DESIGN GUIDE-  
 LINES**

**VOLUME V.1**

**NON-PUBLIC ROADS**

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The list of volumes constituting the detailed technical conditions for the construction of the railway infrastructure of the Solidarity Transport Hub:

Volume A	<a href="#">Introduction to the STH railway standards</a>
Volume I.1	<a href="#">Railway track – layout geometry</a>
Volume I.2	<a href="#">Railway – design of civil structures</a>
Volume I.3	<a href="#">Railway track – drainage of track layout</a>
Volume I.4	<a href="#">Railway track – gauge</a>
Volume I.5	<a href="#">Railway track – geotechnical investigations and design</a>
Volume II.1	<a href="#">2 x 25 kV 50 Hz AC overhead catenary system and traction power supply</a>
Volume II.2	<a href="#">3 kV DC overhead catenary system and traction power supply</a>
Volume III.1	<a href="#">Engineering structures</a>
Volume III.2	<a href="#">Tunnels</a>
Volume IV	<a href="#">Non-OCL power engineering</a>
Volume V.1	<p><b>Non-public roads</b></p> <p>It contains requirements for the design of haul and service roads, the design of crossings, and the design of crossings of haul and service roads with tracks. It specifies the dimensioning rules for roads and parking lots.</p>
Volume V.2	<a href="#">Public roads</a>
Volume VI.1	<a href="#">Control command and signalling – basic equipment</a>
Volume VI.2	<a href="#">Control command and signalling – European Train Control System (ETCS)</a>
Volume VII.1	<a href="#">Fixed and wireless communication systems and data transmission</a>
Volume VII.2	<a href="#">Telecommunication systems and telematics</a>
Volume VII.3	<a href="#">Detection of rolling stock failure conditions (DSAT)</a>
Volume VIII.1	<a href="#">Station and railway station buildings</a>
Volume VIII.2	<a href="#">Technical buildings</a>
Volume VIII.3	<a href="#">Structures</a>
Volume VIII.4	<a href="#">Structural landscaping</a>
Volume IX	<a href="#">Measures to minimise environmental impact</a>
Volume X	<a href="#">Conflicts with external networks</a>
Volume XI	<a href="#">Electromagnetic compatibility (EMC)</a>
Volume XII	<a href="#">Railway line guard</a>
Volume XIII	<a href="#">Technical support facilities</a>
Volume XIV	<a href="#">Health and safety support systems for people and property</a>
Volume XV	<a href="#">Survey control</a>
Volume XVI	<a href="#">Railway rolling stock</a>
Volume XVII	<a href="#">Automatic baggage check-in systems</a>
Volume XVIII	<a href="#">Security, protection and cybersecurity integrity requirements</a>

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Revisions of the document “Detailed technical conditions for the construction of railway infrastructure of the Solidarity Transport Hub; Volume V.1; Non-public roads”:

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# 1 Introduction

## 1.1 Preliminary provisions

- 1) The basis for designing and constructing the structures included in the document entitled “Detailed technical conditions for the construction of railway infrastructure of the Solidarity Transport Hub – Volume V.1 – Non-public roads”, hereinafter referred to as the “Standards”, is the Act of 21 March 1985 on public roads (consolidated text: Journal of Laws of 2020, item 470, as amended). [1] which regulates the issues related to internal roads in Article 7 section 1 and Article 8.
- 2) While preparing the Standards, reference documents have been taking into account that can be found in chapter 8.
- 3) The requirements of the Standards are compliant with the applicable legal requirements for the railway system interoperability in the European Union.
- 4) The standards were developed taking into account the current state of the art in the scope of designing and constructing non-public roads.
- 5) In cases not regulated in the Standards, commonly applicable regulations and engineering knowledge should be used.
- 6) Whenever the Standards refer to “STH railway infrastructure”, “STH railway lines”, etc., this should be understood as new railway infrastructure, new railway lines or other civil structures constructed by STH, which may be managed by another railway infrastructure administrator in the future.

## 1.2 Technical scope

- 1) The standards specify the general technical requirements for design of non-public roads by Centralny Port Komunikacyjny Sp. z o.o., hereinafter referred to as the Company, referred to in point 2).
- 2) In these Standards, all internal roads within the meaning of [1] designed by the Company are treated as non-public roads.

## 1.3 Links to other volumes

The links between this Standards volume and other volumes are presented in Table 1.

Table 1 Links to other volumes of the Standards

Volume No	Volume title	Relation content
I.2	Railway track – construction of a civil structure	Normal sections of a railway line, taking into account the location and parameters of the service roads parallel to the railway tracks.
I.3	Railway track – drainage of track layout	Requirements for drainage of non-public roads.
XII	Railway line guard	Fencing of railway lines. Fire protection of railway lines (including the layout of fire roads).
XIII	Technical support facilities	Road systems of the technical support facilities.

## 1.4 Definitions of terms used

- 1) **Internal road** – a road not included in the category of public roads in accordance with the Act [1].
- 2) **Service road** – an internal road whose main task is to meet the transportation needs related to construction and maintenance of a railway line.
- 3) **Parallel (service) road** – a service road routed in parallel to a railway line in its immediate vicinity (i.e. within the railway line strip), having a one-sided or two-sided connection with the public road network or other internal roads.
- 4) **Perpendicular (service) road** – a service road routed approximately perpendicular to a railway line, having, on the one side, a connection with the public road network and, on the other side, ending in the direct vicinity of the railway line (i.e. in the railway line strip) or having a connection with a parallel (service) road.
- 5) **Facility-internal road** – an internal road ensuring:
  - a) a connection of a structure or civil structures other than a railway line (e.g. maintenance bases) with the public road network,
  - b) fulfilment of internal transportation needs in the area of a structure or civil structures other than a railway line (e.g. in the area of a maintenance base).
- 6) **Fire road** – the road defined in chapter 6 of the Regulation [3].
- 7) **Fire break** – the break defined in § 9 of the Regulation [4].
- 8) **Service crossing** – a single-level crossing of a railway line or a railway siding with an internal road used by the railway manager, not covered by the provisions of the Regulation [5].

## 2 Essential, basic and general requirements for the STH railway infrastructure

Table 2 defines the link between the detailed technical conditions and the essential, basic and general requirements for the STH infrastructure.

Table 2 Essential, basic and general requirements for the STH infrastructure

sub-chapter of this volume defining detailed technical conditions	essential requirements (Railway Interoperability Directive)						basic requirements	general requirements for the STH railway infrastructure			
	1.1. security	1.2. reliability and accessibility	1.3. health	1.4. environmental protection	1.5. technical compliance	1.6. accessibility	2.1. mechanical resistance and stability 2.2. fire safety 2.3. hygiene, health and the environment 2.4. safety and accessibility in use 2.5. protection against noise 2.6. energy economy and heat retention 2.7. sustainable use of natural resources	3.1. oriented towards the needs of the economy	3.2. orientation towards the needs of passengers	3.3. orientation towards the needs of carriers	3.4. compatibility with the railway infrastructure connected with the STH railway infrastructure
3	-	-	-	-	-	-	-	-	-	-	-
4.1	-	1.2.1	-	1.4.7	-	-	2.3.1	-	-	-	-
4.2	-	1.2.1	-	-	-	-	2.1.1	-	-	-	-
5.1	-	1.2.1	-	-	-	-	-	-	-	-	-
5.2	-	1.2.1	-	-	-	-	2.1.1	-	-	-	-
6.1	1.1.4	-	-	-	-	-	2.2.1	-	-	-	-
6.2	1.1.4	-	-	-	-	-	2.2.1	-	-	-	-
7	1.1.11	-	1.3.3	-	-	-	2.4.1	-	-	-	-

## Cybersecurity

Technical solutions which collect, store, process, make available or transmit data ensuring compliance with the essential requirements with respect to safety (requirements from 1.1.1. to 1.1.11. specified in Volume A of the STH railway standards) and general requirements for the STH rail infrastructure with respect to protection (requirements from 1.1.12. and 1.1.13 specified in Volume A of the STH railway standards) should be designed taking into account cybersecurity, i.e. “security of network and information systems”, which is defined in the Directive concerning measures for a high common level of security of network and information systems as follows:

“security of network and information systems” means the ability of network and information systems to resist, at a given level of confidence, any action that compromises the availability, authenticity, integrity or confidentiality of stored or transmitted or processed data or the related services offered by, or accessible via, those network and information systems;

*[as defined in Article 4 of Directive 2016/1148]*

Cybersecurity includes two types of threats resulting from unauthorised access to the systems/equipment/networks that collect, store, process, make available or transmit data:

### 9) physical security threats

It is necessary to secure systems/equipment/networks against direct access which could enable causing (intentionally or unintentionally) threats to functional safety.

### 10) IT security threats

It is necessary to secure systems/equipment/networks against logical access via IT systems/equipment/networks, which could enable causing (intentionally or unintentionally) threats to functional safety.

Cybersecurity defined this way applies both to information systems used for rail transport purposes and to operational systems used for rail transport purposes, but the STH railway standards do not include requirements for information systems, e.g. timetabling systems.

Physical security threats and IT security threats for operational systems for which requirements are defined in the STH railway standards should be addressed by railway operators as part of the risk assessment and by design engineers/manufacturers/contractors as part of threat control. Additionally, it is required for the applied protections to be documented and verified in accordance with the requirements included in Volume XVIII of the STH railway standards.

**Cybersecurity within the scope of this volume of the STH railway standards**

Currently, in the area covered by this volume of standards, there are no networks and information systems whose security could be endangered. However, it is possible that such networks and information systems or technical solutions that collect, store, process, make available or transmit data may arise. For example, a system of sensors may be used that, through wired or wireless networks, public or non-public networks or directly, will connect to, for instance, an infrastructure manager's system. Then, they should be protected against physical security and IT security threats in a manner compliant with the requirements of the Information Safety Management System (ISMS) implemented by the STH company.

At the same time, it should be kept in mind that the ISMS will be subject to changes because maintaining the required level of cybersecurity is not possible by meeting requirements of the standards once since cybersecurity is a process rather than a state. In order to minimise the number and size of cyber threats, the requirements (obligations) included in the Act of 5 July 2018 on the national cybersecurity system in Chapter 3 for operators of key services, in Chapter 5 for public entities should be continuously observed in operational processes and only digital service providers fulfilling the obligations described in Chapter 4 of that Act should be used.

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### **3 Classification and functions of internal roads**

- 1) Due to its function, the STH internal roads are divided into:
  - a) service roads:
    - parallel (to the railway line),
    - perpendicular (to the railway line);
  - b) facility-internal roads;
  - c) roads with fire protection functions:
    - fire road function,
    - fire break function.
- 2) Service roads and facility-internal roads may at the same time serve as roads with fire protection functions.

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## 4 Service roads

### 4.1 General requirements

- 1) In general, for the purposes of construction and maintenance of STH railway lines, parallel roads should be constructed along these lines, at least on one side of them.
- 2) Upon the consent of the Company, the construction of parallel roads referred to in point 1) may be derogated from in the following cases:
  - a) presence of field obstacles (in particular in places where a railway line is routed using engineering structures),
  - b) the availability of the site is limited (which results in the need to narrow the strip of land for a railway line; e.g. in protected, urbanised areas, etc.),
  - c) in situations when it is possible to use the existing, altered or newly constructed public roads as service roads,
  - d) in other cases deemed justified by the Company.
- 3) In the case when the construction of a parallel road in accordance with point 2) is derogated from, access to the railway line should be ensured by constructing perpendicular roads in such a way that access to all structures indicated in point 6) is guaranteed, and, moreover, the length of the railway line section without guaranteed access is not more than 1000 m.
- 4) In situations referred to in point 2) letter c), appropriate conditions should be ensured for safe access from a public road to a fenced area of a railway line and exit from that area to a public road by, among others, providing sufficient space for stopping at the gates and ensuring appropriate visibility conditions at the exits.
- 5) In order to ensure optimal access to the STH railway lines at locations where there are two-level crossings of these lines with public roads, connections of public roads with parallel roads should be constructed or, in the absence of a parallel road, short perpendicular roads leading to the area of direct vicinity of the railway line.
- 6) Service roads should ensure connection with the public road network:
  - a) departure tracks, turnouts located along the route (i.e. at junction or siding signal boxes) and adjustment switches,
  - b) traction substations and sectioning points,
  - c) control command and signalling structures,
  - d) railway overpasses and bridges,
  - e) entrances and exits of railway tunnels and possible evacuation and rescue locations related to railway tunnels,
  - f) maintenance sites (PU) referred to in Volume XIII of the Standards entitled "Technical back-up structures",
  - g) structures related to drainage of railway infrastructure (including storage tanks, infiltration basins, pumping stations, treatment equipment).
- 7) The decision on the construction of service roads perpendicular or parallel to a railway line should be made in accordance with the local conditions, taking into account, among others:
  - a) economic factors:
    - the total length of service roads with specific functions,
    - costs of land purchase;
  - b) technical factors:
    - possibility of using a public road to perform a specific function
  - c) fire protection requirements.

- 8) Service roads should be designed as single-track, single-lane bi-directional roads with passing points, enabling movement of heavy goods vehicles with a weight exceeding 3.5 t.
- 9) At a service road cul-de-sac or a parallel road connection with a perpendicular road, a turn around area should be designed.
- 10) Access to service roads should be restricted in such a way that only authorised users and emergency services can use it.
- 11) If the facility referred to in point 6) is not directly accessible from a service road (e.g. a turnout or CCS equipment located in an excavation or on an embankment), access to this facility from the service road should be provided in the form of a service pedestrian route (sidewalk, stairs or path) along with a wicket in the railway line fencing.  
The requirements for wickets are specified in Volume XII of the Standards entitled: "Railway line guard".
- 12) With respect to the requirements not specified in these Standards, service roads should be designed in compliance with the rules applicable to class D roads in accordance with the Regulation [2].  
In relation to specific locations or the entire project, the Company may request that the Contractor design a service road with other parameters or according to the rules applicable for a class higher than D.
- 13) Normal sections of a railway line, taking into account the location and parameters of service roads parallel to railway tracks are presented in Volume I.2 of the Standards entitled: "Railway track – construction of a civil structure".

## 4.2 Detailed requirements

### 4.2.1 Structure

- 1) The roadway width for a service road should be at least 3.5 m.
- 2) The service road gauge height should be at least 4.5 m.
- 3) In justified cases, the Company may agree to apply a service road gauge height smaller than the one indicated in point 2), but not less than 3.5 m.
- 4) The passing points should be uniformly distributed at distances not exceeding 600 m from each other, maintaining the principle that reciprocal visibility for road vehicles located at two neighbouring passing points must be ensured.

It is recommended to locate passing points:

- a) along straight road sections,
  - b) at crossings, as additional traffic lanes.
- 5) The following parameters should be adopted for passing points:
    - a) roadway width of at least 5 m (two traffic lanes – 2.5 m each),
    - b) length of a passing point without tapers – at least 25 m,
    - c) passing point tapers not larger than 1:2.
  - 6) It is allowed to locate a passing point on the external side of a horizontal curve of a road. In such a case, the width of a passing point roadway should be increased by the widening required under the provisions of the Regulation [2].
  - 7) The turn around area should have a radius of not less than 9,0 m or the shape of a square measuring not less than 12,5 m × 12,5 m.
  - 8) The design of the pavement structure of service roads as well as passing points and turn around areas located along them should be based on a maximum single axle load of 115 kN on the roadway pavement and the pavement intended for vehicle parking.
  - 9) The following pavements are permitted on service roads as well as passing points and turn around areas located along them:
    - a) hard enhanced pavements:
      - bituminous,
      - concrete;
    - b) hard unenhanced – crushed stone;
    - c) other than those mentioned in letter a) and b), proposed by the Contractor, upon the consent of the Company.

### 4.2.2 Drainage

- 1) It is recommended to ensure drainage of service roads by means of appropriate longitudinal and transverse slopes enabling surface runoff of rainwater.
- 2) The service road drainage system should be based on ditches, only in justified cases it is allowed to use rain water drainage system.
- 3) Drainage of service roads should be designed in accordance with the rules specified in Volume I.3 of the Standards entitled: "Railway track – drainage of the track system".
- 4) A water permit should be obtained for discharge of rainwater to waters or water facilities and for construction of water facilities.

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## 5 Facility-internal roads

### 5.1 General requirements

- 1) Facility-internal roads should be constructed to provide a connection with the public road network and internal circulation for civil structures or their complexes other than those specified in chapter 4.1 point 6), and in particular for the maintenance bases.
- 2) Facility-internal roads should be designed as single-track, double-lane bi-directional roads enabling movement of passenger cars and, where planned, heavy goods vehicles with a weight exceeding 3.5 t.
- 3) At a facility-internal road cul-de-sac, a turn around area should be designed.
- 4) With respect to requirements not specified in these Standards, facility-internal roads should be designed in compliance with the rules applicable to class D roads in accordance with the Regulation [2].

In relation to specific locations or the entire project, the Company may request that the Contractor design a facility-internal road with other parameters or according to the rules applicable for a class higher than D.

- 5) Access to facility-internal roads should be restricted in such a way that only authorised users and emergency services can use it.

### 5.2 Detailed requirements

#### 5.2.1 Structure

- 1) The roadway width for a facility-internal road should be at least 5.0 m.
- 2) The facility-internal road gauge height should be at least 4.5 m.
- 3) In justified cases, the Company may agree to apply a facility-internal road gauge height smaller than the one indicated in point 2), but not less than 3.5 m.
- 4) The turn around area should meet the following conditions:
  - a) for passenger cars – a radius of at least 6.0 m,
  - b) for HDVs – a radius of not less than 9,0 m or the shape of a square measuring not less than 12.5 m × 12.5 m.
- 5) The design of the pavement structure of facility-internal roads and turn around areas located along them as well as parking spaces should be based on a maximum single axle load on the roadway pavement and the pavement intended for vehicle parking amounting to:
  - a) 80 kN for vehicles with a total weight of up to 3.5 t,
  - b) 115 kN for vehicles with a total weight of more than 3.5 t.
- 6) On facility-internal roads and turn around areas located along them as well as parking spaces, it is permitted to use hard enhanced bituminous, concrete or concrete paver pavement.

### **5.2.2 Drainage**

- 1) It is recommended to ensure drainage of service roads by means of appropriate longitudinal and transverse slopes enabling surface runoff of rainwater.
- 2) The service road drainage system should be based on ditches, only in justified cases it is allowed to use rain water drainage system.
- 3) Drainage of service roads should be designed in accordance with the rules specified in Volume I.3 of the Standards entitled: "Railway track – drainage of the track system".
- 4) A water permit should be obtained for discharge of rainwater to waters or water facilities and for construction of water facilities.

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## **6 Roads with fire protection functions**

### **6.1 Fire roads**

- 1) Fire roads should be designed in accordance with the Regulation [3].
- 2) If a service road or facility-internal road is used as a fire road, it should meet all technical requirements appropriate for both functions and be more restrictive in the case of divergent requirements.
- 3) The required layout of fire roads is specified in Volume XII of the Standards entitled: "Railway line guard".

### **6.2 Parallel roads with a fire break function**

- 1) It is permitted to use parallel roads as fire breaks.
- 2) The roads referred to in point 1) should meet all the requirements resulting from service road functions and, moreover, should meet the parameters specified for fire breaks in the Regulation [4], i.e.:
  - a) have a width of at least 4.0 m,
  - b) be located at a distance from 2.0 m to 5.0 m from the lower edge of an embankment or the upper edge of a railway crossing cutting, and if there are side ditches – from the outer edge of these ditches,
  - c) have a pavement made of non-flammable materials and free of vegetation (i.e. executed or maintained in such a way that it is not overgrown with vegetation).

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## 7 Service crossings and walkways

- 1) It is recommended to avoid service crossings and walkways in the design solutions.
- 2) The design of service crossings and walkways is allowed only in necessary cases, i.e. in situations when the use of a double-level crossing is not possible due to technical or economic reasons.
- 3) The design of service crossings and walkways is allowed only at intersections of internal roads used for railway administration's own needs with the following tracks:
  - a) additional main station tracks,
  - b) side station tracks,
  - c) tracks located within railway sidings (e.g. technical back-up facilities).
- 4) Service crossings referred to in point 3) letter a) should be designed as level crossings of category F according to the Regulation [5], equipped with automatic or semi-automatic crossing systems connected with the station CCS equipment.
- 5) Service crossings referred to in point 3) letter b) should be designed as level crossings of category F according to the Regulation [5].
- 6) Service crossings referred to in point 3) letter c) should be designed as level crossings of category D or F according to the Regulation [5].
- 7) Service crossings referred to in point 3) letter a), should be designed as category E passages according to the Regulation [5], equipped with automatic or semi-automatic crossing systems connected with the station CCS equipment.
- 8) Service crossings referred to in point 3) letter b) and letter c) should be designed as category E passages according to the Regulation [5].

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## 8 Reference documents

- [1] Ustawa z dnia 21 marca 1985 r. o drogach publicznych (t.j. Dz. U. z 2020 r. Poz. 470, z późn. zm.)
- [2] Rozporządzenie Ministra Transportu i Gospodarki Morskiej z dnia 2 marca 1999 r. w sprawie warunków technicznych, jakim powinny odpowiadać drogi publiczne i ich usytuowanie (t.j. Dz. U. z 2016 r. Poz. 124, z późn. zm.)
- [3] Rozporządzenie Ministra Spraw Wewnętrznych i Administracji z dnia 24 lipca 2009 r. w sprawie przeciwpożarowego zaopatrzenia w wodę oraz dróg pożarowych (Dz. U. z 2009 r. Nr 124, poz. 1030)
- [4] Rozporządzenie Ministra Infrastruktury z dnia 7 sierpnia 2008 r. w sprawie wymagań w zakresie odległości i warunków dopuszczających usytuowanie drzew i krzewów, elementów ochrony akustycznej i wykonywania robót ziemnych w sąsiedztwie linii kolejowej, a także sposobu urządzania i utrzymywania zasłon odśnieżnych oraz pasów przeciwpożarowych (t.j. Dz. U. z 2020 r. Poz. 1247)
- [5] Rozporządzenie Ministra Infrastruktury i Rozwoju z dnia 20 października 2015 r. w sprawie warunków technicznych, jakim powinny odpowiadać skrzyżowania linii kolejowych oraz bocznic kolejowych z drogami i ich usytuowanie (Dz. U. z 2015 r. Poz. 1744, z późn. zm.)

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